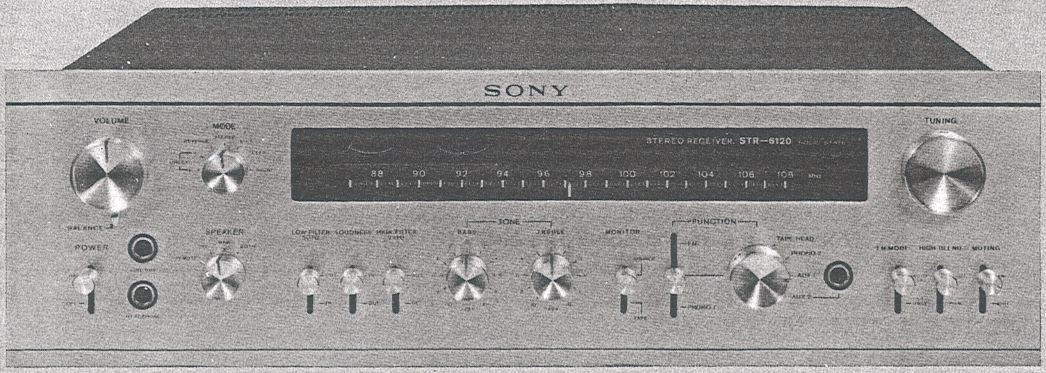
STR-6120


SONY
VOLUME
MODE
STEREO RECEIVER STR-6120
88 90 92 94 96 98 100 102 104 106 108 MHz
TUNING
BALANCE
POWER
SPEAKER
LOW FILTER
LOUDNESS
HIGH FILTER
TONE
BASS
TREBLE
MONITOR
FUNCTION
TAPE HEAD
PHONO 2
AUX 1
AUX 2
FM
PHONO 1
FM MODE
HIGH BLEND
MUTING

STEREO RECEIVER

Specifications

Frequency range: 87 to 108 MHz
Usable sensitivity: 1.8μV (±1 dB), IHF
Selectivity: 100 dB, IHF
Dynamic power: 150W both channels, 8 ohms, IHF
Rated output: 60W each channel, 8 ohms
THD (Audio): Less than 0.2% at 1 kHz under rated output
IMD (Audio): Less than 0.3% at rated output
Power consumption: Approx. 320W (IEC Standard) at rated output
330VA (CSA Standard)
Power requirement: 100, 117, 220, 240 V 50/60 Hz
Dimension: 19″ (w)×5$\frac{11}{16}$″ (h)×15$\frac{7}{8}$″ (d)
(483 mm×145 mm×405 mm w, h, d)
Weight: 34 lb 3 oz (15.5 kg)

SONY®
SERVICE MANUAL

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SECTION 1

GENERAL DESCRIPTION

1-1 Technical Specifications

FM Tuner Section

Frequency range: 87 to 108 MHz

Usable sensitivity: 1.8 μV (±1 dB), IHF

Intermediate frequency: 10.7 MHz

S/N ratio: 70 dB

Capture ratio: 1.0 dB

Selectivity: 100 dB, IHF

Image rejection: 90 dB

I-f rejection: 100 dB

Spurious rejection: 100 dB

A-m suppression: 65 dB

Muting level: 3 μV

Antenna terminals: 300 ohms balanced
75 ohms unbalanced

Frequency response: 20 Hz to 15,000 Hz ±0.5 dB

Harmonic distortion: Mono 0.2% at 400 Hz, 100% modulation
Stereo 0.35% at 400 Hz, 100% modulation

Fm stereo separation: Greater than 40 dB at mid-frequency, 100% modulation

Stereo auto-switching level: 3 μV

SCA suppression: 65 dB

19kHz, 38kHz suppression: 70 dB

Amplifier Section

Dynamic power: 150W ±0.5 dB IHF into 8 ohms, 0.2% THD, both channels

Rated output: 60 W each channel, 4 ohms
60 W each channel, 8 ohms
35 W each channel, 16 ohms

Power band-width: 12 Hz to 70 kHz (8 ohms, IHF)

Harmonic distortion: Less than 0.2% at 1 kHz under rated output
Less than 0.05% at 1 kHz under 1 watt output

IM distortion (SMPTE): Less than 0.3% at rated output
Less than 0.05% at 1 watt output

Frequency response: TAPE HEAD NAB equalization curve ±0.5 dB
PHONO 1, 2 RIAA equalization curve ±0.5 dB
TUNER, TAPE
AUX 1, 2 15 Hz to 120 kHz (-3 dB)
REC/PB (input) at 1W output

Input sensitivity: TAPE HEAD 1.5 mV 500 k ohms
PHNO 1, 2 1.5 mV 47 k ohms
AUX 1, 2 170 mV 100 k ohms
TAPE 170 mV 100 k ohms
REC/PB (input) 170 mV 100 k ohms

Output voltage: REC OUT 170 mV 10 k ohms
CENTER CHANNEL OUT 3.5 V 1 k ohm (at rated output)
LINE OUT 3.5 V 1 k ohm (at rated output)
REC/PB (output) 20mV 80k ohms

Signal-to-noise ratio (IHF): TAPE HEAD Greater than 60 dB
PHONO 1, 2 Greater than 70 dB
AUX 1, 2 Greater than 90 dB
TAPE, REC/PB (input) Greater than 90 dB

Tone control: BASS ±10dB at 100Hz (2 dB/step)
TREBLE ±10dB at 10kHz (2 dB/step)

Filters: HIGH 12 dB/oct. above 9 kHz
LOW 12 dB/oct. below 50 Hz

General Section

Power requirements: 100, 117, 220, 240 V 50/60 Hz

Power consumption: Approx. 320W (IEC Standard)
330 VA (CSA Standard)
at rated output

Dimensions: 19″(w) × 5 11/16″(h) × 15 7/8″(d)
(483 mm × 145 mm × 405 mm w, h, d)

Weight: 34 lb 3 oz (15.5 kg)

1-2 General Information

Tuner

The Field Effect Transistors in the tuner are employed to achieve excellent sensitivity, noise figure and high overload capacity. The Hartley type local oscillator using a silicon transistor provides drift-free operation, eliminating the need for automatic frequency control. Nine i-f stages, using eight piezoelectric resonators, ensure high sensitivity, sharp skirt response and essentially flat response within the selected channel's frequency range. This results in excellent adjacent-channel rejection and low distortion on fm broadcasts. A unique electronic switching system in the multiplex section gives smooth and clickless switching between mono and stereo modes of operation. Switching is fully automatic and immune to the effects of interstation noise. An ingenious muting circuit, employing one FET and nine transistors, cuts out interstation noise without killing those weak stations. This combination results " pulling-in " the weak stations while preserving a smooth and quiet operation. Excellent stereo separation is maintained under all receiving conditions.

Amplifier

The preamplifier, consisting of the equalizer and flat amplifiers, accepts and processes inputs from all sources and distributes output signals to the power amplifier, which delivers up to 150 watts of dynamic power (75 watts each channel) to an 8 ohm load, measured according to the IHF Standards, while being protected by the driver limiters. As mentioned above, the power amplifier has enough capability to emphasize low frequencies employing the Base Boost circuit. In addition, all controls are designed and placed for maximum operating convenience.

1-3 Circuit Description

Following is a description of the function of all the stages and controls in the STR-6120. The description follows the signal path. Refer to the block diagram on page 25 to 28 and the schematic diagram on page 38 to 43.

(A) TUNER

Front End Section

Stage/Control	**Function**
Balun B1-1	This is a transformer that matches either 75-ohm coaxial cable or 300-ohm twin lead to the tuner's input stage.
RF Amplifier Q_{101}, Q_{105}	The rf amplifier is designed to provide stable amplification, sharp selectivity at fm broadcast frequencies, and an optimum noise figure. Field-effect transistors are ideally suited for this job as they have characteristics similar to that of a triode and in addition have wide dynamic range. The latter characteristic results in very low cross-modulation products. The stage employs two FETs in a common-gate (similar to a grounded-grid circuit) configuration to compensate the tolerance of FET's operating characteristics. The triple-tuned coupling is employed between rf and mixer stages to provide sharp selectivity. The secondary winding of L_{101} is tapped-down to match the low input impedance of the common-gate amplifier.
Local Oscillator Q_{104}	Q_{104} supplies injection signals to the mixer through L_{105}. The circuit is a Hartley type with feedback applied to the emitter from the tap on L_{105}. Temperature changes have little effect on the oscillator tuning. The oscillator is extremely stable and does not require AFC.
Mixer Q_{102}	Rf signals and local-oscillator signals are heterodyned in the gate-source junction of Q_{102} to produce the 10.7 MHz intermediate frequency output. IFT_{101} is a tuned transformer to develop the i-f output and provide required selectivity. The low impedance output winding is provided to match the following i-f stage.
I-F Amplifier Q_{103}	This stage amplifies the output of the mixer to drive the i-f amplifier section that follows.

I-F Amplifier Section

I-F Amplifiers Q_{201} to Q_{203}	These i-f stages are basically RC coupled amplifiers that provide essentially flat response.
Solid-State Filters CF_{201} to CF_{208}	The selectivity of this section is determined by the solid-state filters in the interstage coupling paths.

Stage/Control	Function
	They are basically two-section ceramic filters that operate in a "trapped-energy" mode. The filters provide extremely sharp skirt selectivity and flat response inside the pass band. These filters determine the overall selectivity of the tuner.
Diode Limiters D_{201} to D_{208}	Limiting is accomplished by these diode pairs, connected in parallel and poled in opposite directions.

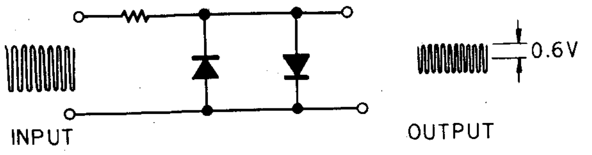


Fig. 1-3-1 Diode Limiter

	The diodes conduct when the voltage across them exceeds the barrier potential of about 0.6 volts. Thus, the signal is limited in both directions to 1.2 volts peak-to-peak. The diodes provide symmetrical limiting.
I-F Amplifier Q_{204}	The diode limiters are passive devices and introduce loss. Therefore amplifiers, such as Q_{204} provide additional gain needed to drive the limiters.
Muting Circuit Detector Q_{206}, D_{209}, D_{210}	The i-f signal is extracted from the collector of Q_{204} to drive the muting circuit detector. Q_{206} acts as a buffer amplifier to drive the voltage doubler D_{209}, D_{210} and associated capacitors C_{227}, C_{228} and C_{229}. The output of this circuit is a positive dc voltage proportional to the carrier level. This dc voltage is applied to Q_{410} on the Muting Circuit Board.
Tuner Input Meter M-1	An i-f output from the collector circuit of Q_{205} is coupled to D_{211} through C_{230}, R_{249}. This half-wave rectifier feeds a dc signal to the TUNER INPUT METER M-1. Since all previous stages have fixed gain, the current through M-1 is directly proportional to the signal level. R_{251} is the calibration adjustment.

Limiter-Detector Circuit Section

Stage/Control	Function
I-F Amplifiers Q_{301}, Q_{302} Diode Limiters D_{301} to D_{304}	These are conventional RC coupled amplifiers that supply the necessary interstage gain to drive the diode limiters.
I-F Output Q_{303}	Q_{303} provides the power to drive the ratio detector.
Ratio Detector D_{305}, D_{306}	IFT_{301} and the diodes D_{305} and D_{306} form a balanced ratio detector that transforms the frequency-modulated signal into an audio signal.
R_{319}	The output of the ratio detector appears across R_{322}. R_{319} is the balance control for the ratio detector.
Tuning Meter M-2	A null-type meter connected across the balanced output of the ratio detector is used as a tuning indicator. C_{323} removes the ac component of the signal.
Emitter Follower Q_{304}	Q_{304} supplies demodulated signals to the MPX and Muting circuits.

Multiplex Decoder Section

The stereo signal is extracted by a switching or time-division decoder.

Q_{501}	This amplifier stage provides two outputs. The composite f-m signal is extracted from its emitter circuit, and the 19 kHz pilot signal is taken from a tuned circuit in the collector circuit.
19 kHz Amplifier Q_{502}	The 19 kHz pilot signal, separated by the tuned coupling circuits between Q_{501} and Q_{502}, is amplified by Q_{502} to drive the frequency doubler.
Frequency Doubler D_{501}, D_{502}	Signals developed at the collector of Q_{502} are transformer coupled to the full-wave rectifier D_{501} and D_{502}.

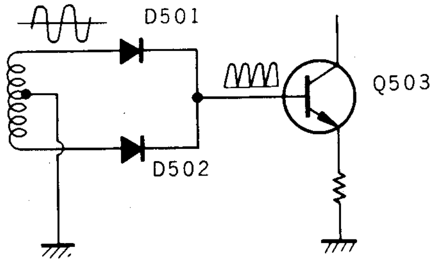


Fig. 1-3-2 Frequency Doubler

The output of this rectifier is not filtered, and produces two positive pulses for each input cycle. Thus the 19 kHz frequency is effectively doubled by D_{501} and D_{502}. However, the waveform is not sinusoidal at the base of Q_{503}.

Stage/Control	Function
38 kHz Amplifier Q_{503}	The 38 kHz pulses produced by D_{501} and D_{502} are amplified by Q_{503}. The tank circuit at the collector of Q_{503} is tuned to 38 kHz to restore the sinusoidal wave-shape to the signal. This signal is transformer coupled to the bridge-type demodulator to supply sampling drive for the demodulator.
Pilot and SCA Filters C_{507}/L_{505} and C_{508}/L_{506}	The composite signal is coupled from the emitter of Q_{501} to the resonant circuits C_{507}/L_{505} and C_{508}/L_{506}. The first one of these is tuned to 19 kHz to eliminate the pilot carrier. The second tank tunes to 67 kHz to eliminate the SCA signal.
Multiplex Demodulator D_{503} to D_{506}	The demodulator circuit employs four diodes in a balanced bridge arrangement. The system cancels much of the residual rf products. The 38 kHz pulses switch the composite signal in the switching transformer to produce L and R signals at the output when the tuner operates in the stereo mode.
De-emphasis C_{516}, C_{517}	These capacitors are selected to provide the necessary roll-off at high audio frequencies to compensate pre-emphasis at the transmitter.
Audio Preamplifier Q_{504}, Q_{505}	Demodulated L and R signals are amplified by these stages.
HIGH BLEND Switch S_{15}	The HIGH BLEND switch allows the mixing of high frequency audio signals between stereo channels. When placed in the IN position the switch operates to reduce the noise of demodulated stereo signal.
Gain Adjustment R_{531}, R_{532}	These resistors are factory selected to compensate for differences in demodulator efficiency and provide equal overall gain in both channels.
Channel Separation Adjustment R_{537}	The network that connects the emitters of Q_{504} and Q_{505} provides a form of negative feedback between left and right channels. Any residual L signals in the R channel are cancelled out by the signals from the L channel. The same is true on residual R signals in the L channel. R_{537} is therefore set the maximum channel separation.
Emitter Followers Q_{506}, Q_{507}	Emitter followers are used at this point to provide a low-impedance source of signal for the low-pass filters that follow.
Low-pass Filter LPF_{501}	The filter removes all residual i-f and subcarrier components. It is important that these components be removed completely to prevent beat interference with bias oscillators in tape recorders fed from the tuner.
Audio Amplifiers and Emitter Followers Q_{508} to Q_{511}	Transistors Q_{508} and Q_{509} make up for the insertion loss of the low-pass filter. Q_{510} and Q_{511} act as emitter followers to produce output signals across a low-impedance. Positive feedback is employed between the collectors of Q_{510} and Q_{511}, and the emitters of Q_{508} and Q_{509} respectively through C_{525} and C_{526} to compensate the loss of high audio frequencies in the low-pass filter.
Mode Switching Q_{512} to Q_{514}	These three transistors operate as direct-coupled switches to establish the operating mode.

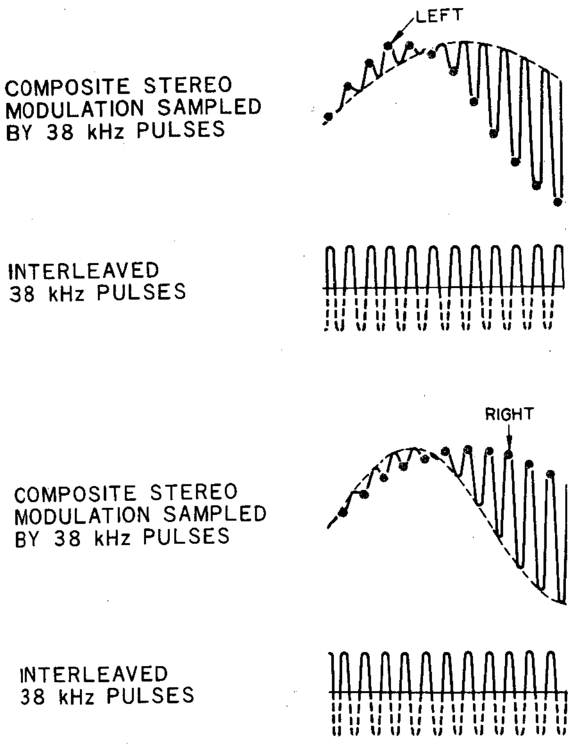

LEFT
COMPOSITE STEREO MODULATION SAMPLED BY 38 kHz PULSES
INTERLEAVED 38 kHz PULSES
RIGHT
COMPOSITE STEREO MODULATION SAMPLED BY 38 kHz PULSES
INTERLEAVED 38 kHz PULSES

Fig. 1-3-3 Stereo Switching Mode

Stage/Control	Function
Mode Switch in AUTO ST position	When a stereo signal is received, the dc component of the signal developed by the 38 kHz doubler (D_{501}, D_{502}) is coupled through R_{509} to turn on Q_{512}. This turns Q_{513} off and Q_{514} on. When Q_{514} is saturated the forward bias applied to D_{503} and D_{506} in the multiplex demodulator is removed and the demodulator operates in the multiplex mode.
Mode Switch in ST ONLY position	The switching circuit consisting of Q_{512}, Q_{513} and Q_{514} functions in the same way as in the AUTO ST position, except that the muting relay REL-1 is controlled by Q_{514}. (See Muting Circuit Section.) The effect is to mute all but stereo signals.

Muting Circuit Section

These circuits act to mute output when tuning is between stations or not sufficiently tuned to the center of a channel.

Stage/Control	Function
Interstation Muting Q_{409}, D_{401}, D_{402}	The hiss and static of interstation noise are extracted from the emitter of Q_{304} and applied to the base of Q_{409}. R_{420} and C_{402}, in the coupling circuit, filter out audio components so that the signal is primarily noise. Q_{409} amplifies the noise component and drives the voltage doubler, D_{401} and D_{402}. When interstation noise is received the dc output of D_{401} and D_{402} brings Q_{406} into conduction.
Muting Relay Actuator Q_{407}, Q_{408}	This in turn, cuts off Q_{407} and the collector voltage of Q_{407} rises toward B+. The collector of Q_{407} is coupled to the base of Q_{408} through the FM MODE Switch S_{14}, when it is in the AUTO ST position. Thus, Q_{408} turns on as Q_{407} turns off.
Muting Relay REL-1	The muting relay coil is in the collector circuit of Q_{408}. When this relay energizes, the audio output of both channels is shorted to ground.
Muting for the Detuned Condition Q_{401} to Q_{405}	The muting relay is also actuated if a station is being received but there is a considerable tuning error. This muting circuit operates from the negative or positive output of the ratio detector when the received station is not at the center of the detector's S curve. Dc output of the ratio detector, developed across C_{321}, is coupled to the gate of Q_{401}. The FET, Q_{401} is biassed so that Q_{402} is on and Q_{403} is off when there is zero dc at the ratio detector (correctly-tuned condition). As a result, Q_{404} is on and Q_{405} is off. Note that Q_{405} and Q_{406} share a common load. They act as an OR gate. If either Q_{405} or Q_{406} is off the muting relay will be de-energized. Thus, when the set is tuned correctly the muting system is inactive. A positive or negative output of the ratio detector triggers the muting system as follows. Consider a positive input to the FET, Q_{401}. The FET conducts more heavily, its drain voltage drops and Q_{402} cuts off. This makes Q_{404} cut off since Q_{404} can conduct only when Q_{402} is on and Q_{403} is off. If the set is detuned to produce a negative output, Q_{401} conducts less and both Q_{402} and Q_{403} come into conduction. In this case, as noted above, Q_{404} cuts off. Thus, Q_{404} cuts off if the output of the ratio detector is near its positive or negative peak. When Q_{404} cuts off, Q_{405} comes into conduction and, following the previously described action of Q_{407} and Q_{408}, the muting relay is energized.
Muting for Low Level Signals D_{209}, D_{210}, Q_{410}	In addition to interstation and detune-muting, the muting relay is also actuated if the signal level is below the value specified. This system operates from the dc output of the carrier level detector D_{209} and D_{210}. When the input signal is strong enough for operation in the stereo mode (20 db/μ or more) the positive voltage developed by D_{209} and D_{210} is applied to the base of Q_{410}. This transistor is normally cut off, but if the dc output of D_{209} and D_{210} swings positive enough, Q_{410} conducts and makes Q_{405} cut off. The latter results in the release of the muting relay.
MUTING Switch S_{13}	The muting system is disabled when the muting switch is set to OUT position. In this case a positive voltage is put at the base of Q_{407} through R_{416}. This turns on Q_{407} and keeps Q_{408} off. As the result the muting relay REL-1 is kept open.

Stage/Control	Function
Muting in the ST ONLY	When the FM Mode switch is in the ST ONLY position, Q_{408} is controlled by Q_{514}. The latter is on when 19 kHz pilot signal is detected in the D_{501}, D_{502} circuit. When Q_{514} is on, Q_{408} the muting relay is off. If the level of the pilot signal should drop so that Q_{514} turns off, Q_{408} will conduct and mute the output. Thus the tuner is muted except when a stereo signal is received.
Stereo Lamp PL_4	The stereo lamp lights when Q_{514} is on. Q_{514} acts as the ground return for the lamp when the transistor is switched into conduction.
Click Suppressor Q_{515}	Transistor Q_{515} is a click suppressor. It acts to mute click noises that occur at the moment of switching the FM mode switch or fm broadcast turns its signal from mono to stereo or vice versa. Q_{515} varies the dc bias which is applied to the diodes D_{503} and D_{506} through R_{577}, R_{517} and R_{515} according to the trigger voltages that are supplied to its base. Q_{515} receives positive turn-on voltages from the emitter of Q_{408}, the muting relay driver and MODE switch S_4 through R_{572}. When Q_{515} conducts, the forward bias for D_{503} and D_{506} is reduced to zero, blocking composite signals electronically, while C_{531} is discharged through Q_{515}. C_{531} acts to delay the voltage change of bias voltage for D_{503} and D_{506} to provide clickless operation when Q_{515} turns off.

(B) AUDIO AMPLIFIER SECTION

Preamplifier Section

Stage/Control	Function
Equalizing Amplifier Q_{601} to Q_{603}	This stage is a direct coupled amplifier which amplifies the small signal produced by a magnetic cartridge or tape head to the level required at the input of the flat amplifier. In addition, RIAA and NAB equalization is achieved in conjunction with the settings of function switches S_1 and S_2. Q_{601}, Q_{602} and Q_{603} form a three-stage direct-coupled amplifier having a voltage gain of 41 dB at 1 kHz.
C_{605} and R_{613}	Negative feedback is applied from the collector of Q_{603} to the emitter of Q_{601} through the combination of C_{605} and R_{613} to improve frequency response and minimize harmonic distortion. Since the frequency response of this stage is determined by frequency characteristics of the feedback loop, two feedback loops, designed to satisfy the record and tape equalizing curves, are employed.
R_{620}, to R_{622} C_{608}, C_{609}	RIAA equalization is accomplished by the negative feedback loop containing these components.
R_{623}, C_{610}, C_{611}	NAB equalization is accomplished the negative feedback loop containing these components. When the Function Switch is set to FM or AUX-1, -2 input signals are connected directly to the flat amplifier of Q_{604} and Q_{605}.
Monitor Switch S_3	Selects the signals from TAPE IN (TAPE position) or equalizer output (SOURCE position).
Mode Switch S_4	Selects the desired mode of operation. This switch may also be used for test purposes. The relation between the positions of the Mode Selector Switch and the outputs of the Receiver are summarized in the table below.

RECEIVER OUTPUTS / MODE SELECTOR SWITCH POSITION	SPEAKER OUT; LEFT	SPEAKER OUT; RIGHT	CENTER CHANNEL OUT	HEAD-PHONE OUT; LEFT	HEAD-PHONE OUT; RIGHT	LINE OUT; LEFT	LINE OUT; RIGHT	REC OUT; LEFT	REC OUT; RIGHT
CHECK L	L+R	—	L+R	L+R	—	L+R	—	L+R (L)	L+R (R)
CHECK R	—	L+R	L+R	—	L+R	—	L+R	L+R (L)	L+R (R)
REVERSE	R	L	L+R	R	L	R	L	L	R
STEREO	L	R	L+R	L	R	L	R	L	R
L+R	L+R	L+R	L+R	L+R	L+R	L+R	L+R	L+R	L+R
LEFT	L	L	L	L	L	L	L	L	R
RIGHT	R	R	R	R	R	R	R	L	R

Note: When the MONITOR switch is set to the TAPE, the REC OUT outputs provide the signals shown in parenthesis.

Stage/Control	Function
Flat Amplifier Q_{604}, Q_{605}	This two-stage amplifier provides a 18 dB voltage gain to increase the signal to the level required at the input of the power amplifier.
Loudness Switch S_5	This switch compensates for the characteristics of the human ear which vary according to the loudness of the sound being heard. When this switch is set to the "IN" position, high and low frequency components are increased in conjunction with decreasing volume control setting, as follows. S_5 OUT { Flat response at 500 mW output S_5 IN { 6.4 dB up at 40 kHz 2.8 dB up at 10 kHz 6.0 dB up at 50 Hz at 500 mW output
Volume Control R_{629}	The level of the signal applied to the flat amplifier is determined by the setting of R_{629}, an audio taper control.
Balance Control R_{628}	Employed to optimize stereo reproduction. To get rid of insertion loss at the mechanical center, a special potentiometer, having conductor coating at the midrange setting, is used.
Treble Control S_6	Increases or decreases the prominence of high frequencies by switching the filter resistors in steps. Each switch step changes treble response approximately 2 dB at 10,000 Hz. This is accomplished by negative feedback from the output of Q_{605} to the emitter of Q_{604}.
Bass Control S_7	Similar to treble control except for filter components and frequency characteristics. Each step of this switch changes base response approximately 2 dB at 100 Hz.
High Filter Switch S_8	Eliminates unwanted high-frequency components from the input signal (12 dB/oct above 9 kHz) in the IN position.
Emitter Follower Q_{606}	Q_{606} acts as a buffer between high and low filters. The emitter follower provides high input impedance and low output impedance.
Low Filter Switch S_9	High-pass filter cuts out unwanted low frequency components from the input signal. These unwanted low frequencies include rumble created by the turntable, record changer, or the record itself. The amount of drop in signal strength is 12 dB/oct below 50 Hz when the low filter switch is set to the IN position.

Power Amplifier Section

Stage/Control	Function
Flat Amplifier Q_{801}	This is a conventional amplifier to power the driver stage Q_{802} to which it is directly coupled. R_{809} acts as an ac load resistance.
Driver Q_{802}	Q_{802} acts as a driver for the complementary circuit that follows. It provides sufficient positive and nagative voltage swings for generating the required output power. R_{814} is an ac load resistance.
Complementary Circuit Q_{807}, Q_{808}	These transistors operate as emitter followers to provide the current swings demanded of the output stages and also provide the necessary phase inversion. Phase inversion is performed by using PNP and NPN type transistors.
DC Bias Supply Q_{803}	The small amount of voltage across Q_{803} emitter to collector adds to the voltage drop across D_{802} and D_{801} to supply the correct operating voltages to forward bias Q_{807} and Q_{808}.
DC Bias Adj. R_{813}	R_{813} is employed to control the base bias of Q_{803}, thus determining the impedance between emitter and collector of Q_{803} and so the voltage of the dc bias supply.
Thermal Compensator D_{802}	The negative temperature coefficient of D_{802} allows thermal compensation of the complementary circuit by controlling its bias voltage.
Driver Limiter (1) Q_{804}	Q_{804} limits the positive-going half cycle of the drive voltage applied to the base of Q_{809} when power consumption at the Q_{809} collector exceeds the safety margin. Since power dissipation at the collector can be considered a function of collector voltage and current, the trigger signal for Q_{804} is taken from the collector and emitter of Q_{809}. Q_{804} is forced to conduct when the voltage applied across its base and emitter exceeds its barrier voltage. Base voltage is determined by the ratio of resistance of R_{823} to CS_1.

Stage/Control	**Function**
	Emitter voltage is determined by the current that flows in R_{833}. During normal operation Q_{804} is cut off. When excessive current flows in a power transistor or power dissipation at the collector of the power transistor exceeds the transistor's safety margin, Q_{804} turns on and limits the input drive voltage to the power transistor.

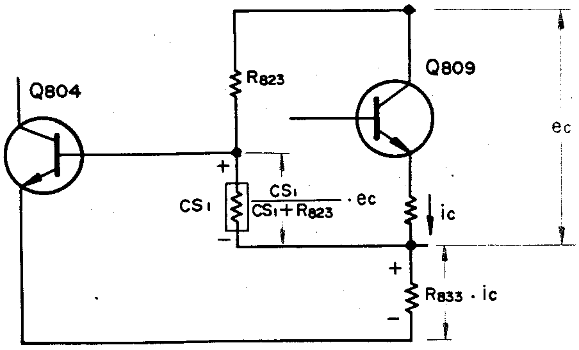


Fig. 1-3-4 Driver Limiter

Stage/Control	**Function**
Heat Wave Sensor CS_1	This electronic device is called "ceramistor". It senses the heat generated by the output transistors. The resistance of the "ceramistor" increases due to its positive temperature coefficient and forces Q_{804} into saturation. This reduces the driving voltage to the power transistor.
Driver Limiter (2) Q_{805}, Q_{806}	Q_{805} and Q_{806} limit the negative-going half cycle of the signal applied to the base of Q_{810} when power dissipation at the Q_{810} collector exceeds its safety margin. The basic principle involved is the same as described in the Driver Limiter (1) except for polarity.
AC Balance Adj. R_{805}	R_{805} determines the center-line voltage to obtain the minimum harmonic distortion at the rated output.

Power Supply Section

Regulated Power Supply Q_2, to Q_4	Dc output from the rectifier is filtered by C_{15} and and applied to the series regulator Q_2. Transistor Q_4 compares a sample of the output voltage, picked off at R_{10}, with a reference voltage supplied by the zener diode D_3. A change in output voltage, detected by Q_4, results in a change in conduction of Q_3 and Q_2 that offsets the original voltage shift. The stable 24V dc voltage is supplied to the tuner section.
Power Supply for Audio	A full-wave bridge rectifier provides a positive dc 93 volts across filter-capacitor C_5 (2000μF).
Ripple Filter Q_1, R_1, R_2, C_7	To improve the signal-to-noise ratio in the audio amplifiers, ripple components in the amplifier dc supply should be reduced as much as possible. Q_1 serves as an electronic filter to supply well filtered 87V and 57V power to the preamplifier and power amplifier sections. R_1 and R_2 determine the conduction of Q_1 and, therefore, the output voltage. The filter capacitor in the base circuit of Q_1 acts as an equivalent of a much larger capacitor across the output.

SECTION 2
DISASSEMBLY

2-1 Removal of Top Cover and Bottom Plate

(a) Remove two machine screws at each side of the receiver and lift the top cover straight up.

(b) Loosen off seven Phillips-Head screws (+RF 3φ×6) at the bottom of the receiver and pull the bottom plate towards the rear of the receiver. See Fig. 2-1-1.

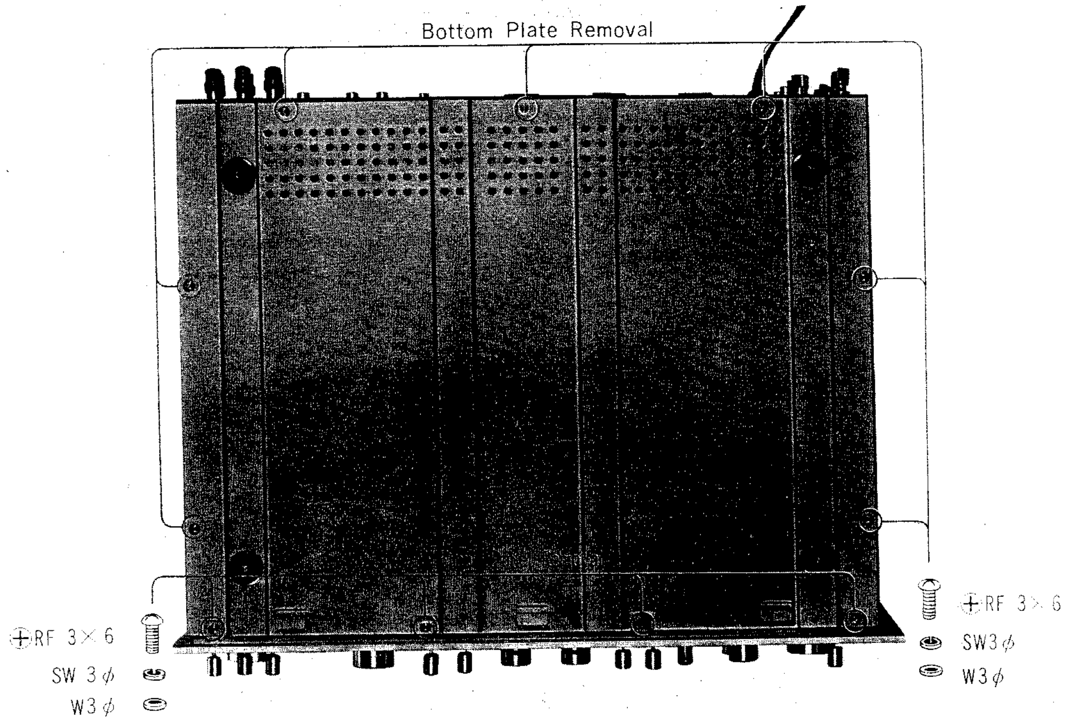


Fig. 2-1-1 Bottom Plate and Front Panel Removal

2-2 Front Panel Removal

(a) Remove the top cover.

(b) Remove all control knobs and levers. The knobs can be removed by loosening the slotted set screws and pulling the knobs straight out. The levers are simply pulled off.

(c) Loosen off four Phillips-Head screws (+RF 4φ×6) behind the top edge of the Front Panel Assembly (the vertical bracket that mounts the dial and tuning meters). See Fig. 2-2-1 on next page.

(d) Turn the receiver over and loosen off four Phillips-Head screws (+RF3φ×6) at the front bottom edge of the chassis. See Fig. 2-1-1. This frees the front panel.

2-3 Removal of the Front Panel Assembly

The Front Panel Assembly is the vertical member on which the glass dial, tuning meters and pilot lamps are attached. The Front Panel Assembly must be removed to re-string the dial cord.

Follow this procedures:

(a) Remove the cover, all knobs and the front panel. See Section 2-1 and 2-2.

(b) Loosen off two flat head screws (+K3φ×6) at each side of the chassis and one screw (+RF3φ ×6) that secures the sub-pannel to the volume control and mode switch bracket. See Fig. 2-2-1 on next page.

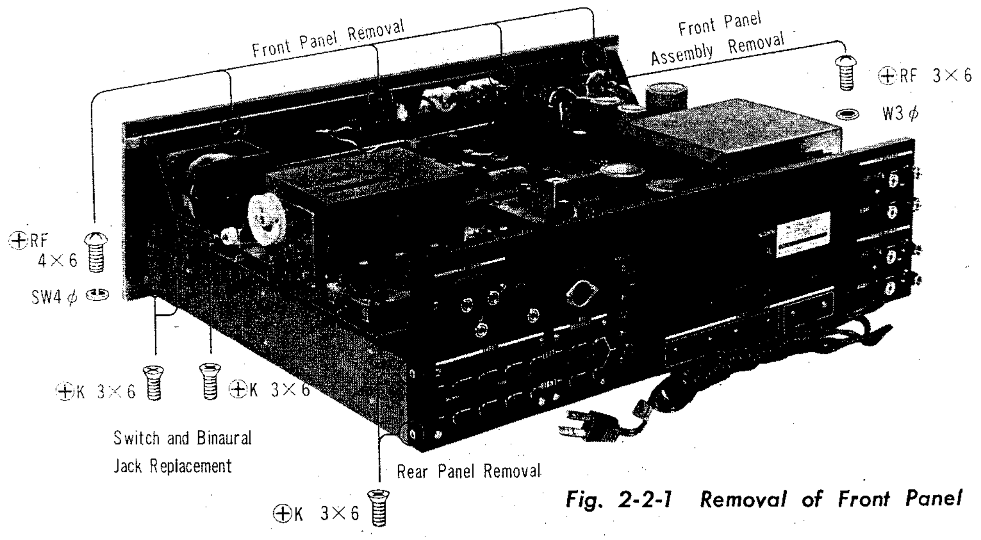

Front Panel Removal
Front Panel Assembly Removal
⊕RF 3×6
W3φ
⊕RF 4×6
SW4φ
⊕K 3×6
⊕K 3×6
Switch and Binaural Jack Replacement
Rear Panel Removal
⊕K 3×6

Fig. 2-2-1 Removal of Front Panel

(c) Unsolder the lead wire from the dial lamp.
(d) Take out the stereo lamp.
(e) The Front Panel Assembly is now free, and can be tilted forward and down as shown in Fig. 2-3-1.

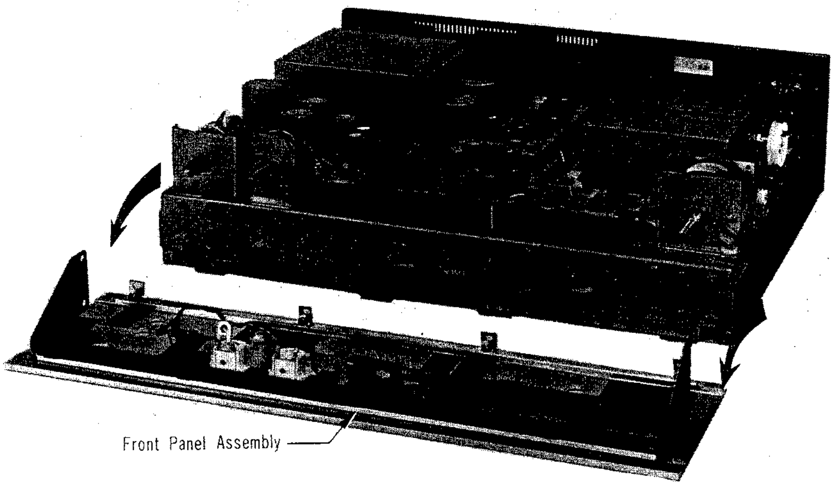

Front Panel Assembly

Fig. 2-3-1 Removal of Front Panel Ass'y

2-4 Switch and Binaural Jack Replacement

(a) Remove the cover, bottom plate and front panel. See Sections 2-1 and 2-2.
(b) All switches except for the mode switch and volume control now can be removed by loosening screws and nuts.
(c) To take the binaural jacks out, remove the switch and control assembly by loosening the two screws (+K3ϕ×6) at each side of the chassis as shown in Fig. 2-2-1. Now tilt the assembly forward and down. The jacks can now be removed by loosening the screws that secure them to the chassis.

2-5 Pilot Lamp Replacement

(a) Unplug the ac cord.
(b) Remove the top cover. See Section 2-1.

Meter Lamp

(a) Straighten the tab of lamp socket bracket to permit removal of the lamp.
(b) Pull out the socket.
(c) Unscrew the lamp from the socket and install the replacement.
(d) Insert the socket into the bracket and bend the tab to hold the socket in place.

Stereo Lamp

(a) Push the stereo lamp out from the inside of the bracket.
(b) Unscrew the lamp from the socket and install the replacement.
(c) Insert the socket into the bushing.

Dial Lamps

(a) Remove the front panel. See Section 2-2.
(b) Pry out the lamp. Push the replacement lamp into the clip.

2-6 CS_1 (Ceramistor) Replacement

(a) Remove the bottom plate. See Section 2-1.

(b) Loosen off two machine screws (+K3φ×6) securing the rear panel at each side of the chassis as shown in Fig. 2-2-1.

(c) Pull the rear panel forward and down. See Fig. 2-6-1.

(d) Loosen off two machine screws (+RF3φ×6) that hold the CS_1 mounting base. See Fig. 2-6-1.

(e) Unsolder the leads of CS_1. Remove it and install the new one.

(f) To reassemble, reverse the foregoing procedure. Be sure that CS_1 is attached to the power transistor. Add silicone grease if necessary.

2-7 Thermo-compensator Diode (SV31) Replacement

(a) Remove the bottom plate. See Section 2-1.

(b) Loosen off two machine screws (+K3φ×6) at each side of the chassis as shown in Fig. 2-2-1.

(c) Pull the rear panel forward and down. See Fig. 2-6-1.

(d) Loosen off a screw (+RF3φ×14) securing terminal strip to heat sink. Take out the terminal strip with SV-31.

(e) Unsolder the defective SV-31 and install the replacement.

(f) When securing the terminal strip, make sure SV-31 is attached to the heat sink and add silicone grease if necessary.

2-8 Dial Glass Replacement

(1) Remove the front panel. See Section 2-2.

(2) Remove the screw (+RF2.6φ×5) that secures the dial glass bracket to the sub chassis as shown in Fig. 2-8-1.

(3) Install the new dial glass.

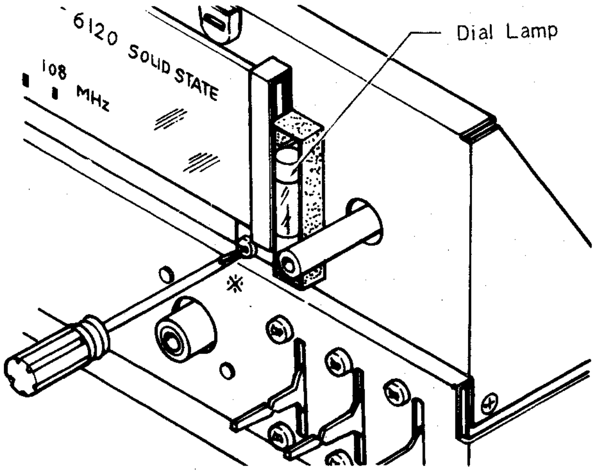


Fig. 2-8-1 Dial Glass Replacement

2-9 MODE Switch and VOLUME/BALANCE Control Replacement

Preparation: Set the new BALANCE control to its electrical center as follows.

(a) With a piece of hook-up wire, solder between center terminals Ⓑ and Ⓑ', measure a resistance between terminals Ⓐ and Ⓒ' by an ohmmeter. See Fig. 2-9-1 on next page.

(b) Turn the BALANCE control shaft, outer one, to obtain a minimum reading on the ohmmeter. Now the BALANCE control is set to its electrical center. Unsolder the hook-up wire.

Procedures:

(1) Remove the front panel assembly. See Section 2-3.

(2) The MODE switch and VOLUME/BALANCE control can be removed by the loosening out hexnuts that secure them to the mounting bracket.

(3) Install the new one.

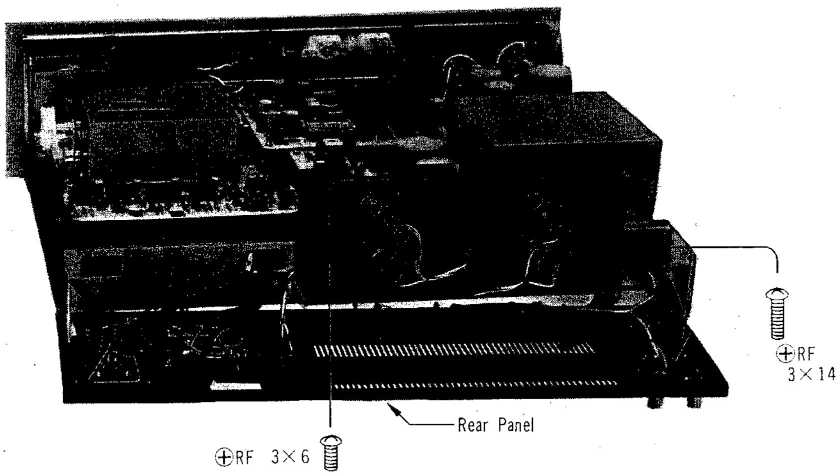


Fig. 2-6-1 Removal of Rear Panel

(4) Insert the spacer in order that the BALANCE control swings away from the BALANCE mark on the front panel the same amount in either direction. Take care that the spacer for the BALANCE control is in place so that its lugs line up with the horizontal line at its electrical center set already.

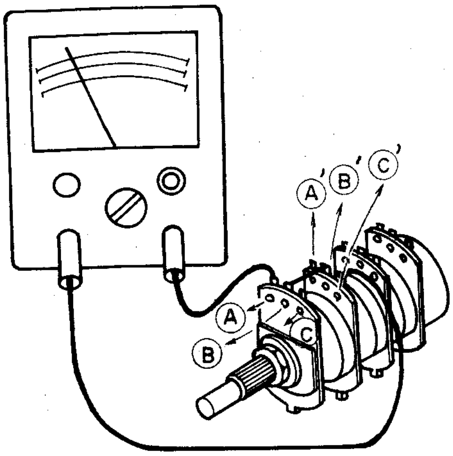


Fig. 2-9-1 BALANCE Control Setting

2-10 Power Transistor Replacement

(1) Loosen off two screws (+K3ϕ×6) at each side of the chassis to tilt the rear panel. See Fig. 2-6-1.

(2) Loosen off two screws (+RF3ϕ×4) securing the transistor to the heat sink.

(3) Install the replacement.

(4) When replacing a power transistor, apply a coat of heat-transferring silicone grease to both sides of the mica insulation. The grease fills the tiny dents in the mating surfaces, thereby improving heat transfer to the heat sink.

(5) Any excess grease, that is squeezed out when the mounting bolts are tightened, can be wiped off with a clean cloth, to prevent it from attracting conductive dust particles that would eventually short out the insulation.

2-11 Dial Cord Stringing

Preparation: Remove the Front Panel Assembly. See Section 2-3.

(a) Cut a 61-inch (1,550 mm) length of dial cord.

(b) Slowly rotate the tuning capacitor drive drum fully clockwise (minimum capacitance position).

(c) Apply solvent to the Phillips head screw holding the tuning capacitor drive drum to its shaft and remove the screw and flatwasher. Pull the drive drum straight off its shaft.

(d) Tie one end of the cord to one of the holes in the drive drum and hook the spring onto the other hole, See Fig. 2-11-1. Install the drum and tighten its holding screw.

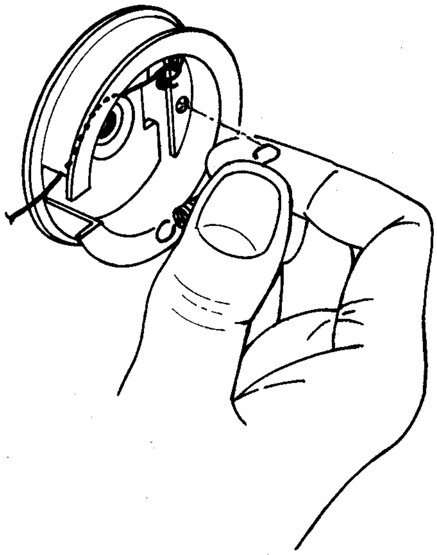


Fig. 2-11-1 Dial Cord Stringing Start and Finish Point

(e) Run the cord through the slot in the rim of the drive drum and position the cord close to the rear edge of the drum.

(f) Wrap the cord clockwise around the drum as shown in Fig. 2-11-2 and run the cord around the pulleys (A), (B), (C) and (D). See Fig. 2-11-3.

(g) Pull the cord taut and wrap three clockwise turns around the tuning shaft.

(h) Run the cord over pulleys (E) and (F).

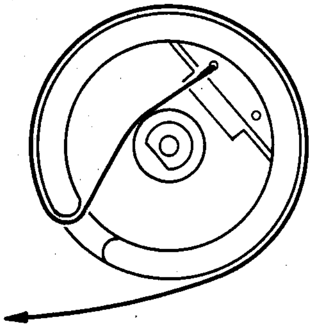


Fig. 2-11-2 Dial Cord Stringing

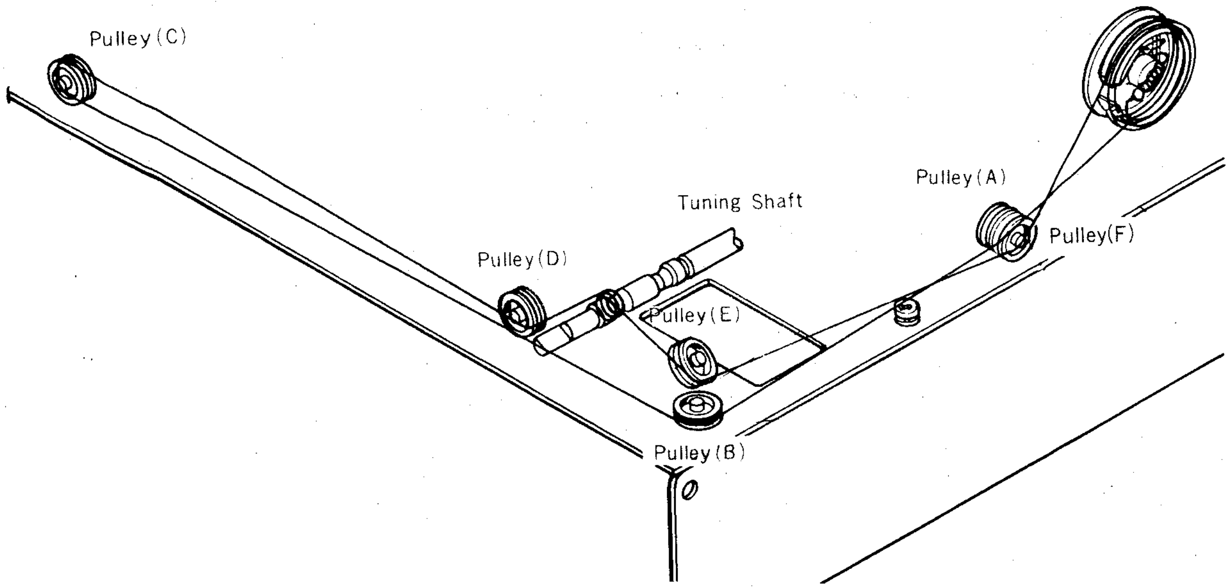


Fig. 2-11-3 Complete Dial Cord Stringing

(i) Make three clockwise turns around the drive drum and pass the cord through the slot of the drive drum. Hook the cord to the spring, using an eyelet, as shown in Fig. 2-11-4.

(j) Pull the cord to give it a tension and squeeze the eyelet. Make a knob to keep the spring under tension. See Fig. 2-11-4.

(k) Put the dial pointer in place and run the dial cord under and through the tabs at the rear of the dial pointer. See Fig. 2-11-5.

(l) After completing dial cord threading, and making sure the tuning system works properly, put a drop of contact cement on the eyelet, at the place where the cord runs under the tabs of the dial pointer, and on the screw holding the tuning capacitor drive drum to its shaft. See SECTION 4, OVERALL ADJUSTMENT for the method of accurate locating the dial pointer.

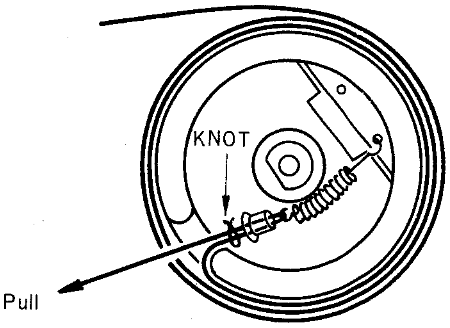


Fig. 2-11-4 Dial Cord Finish Point Detail

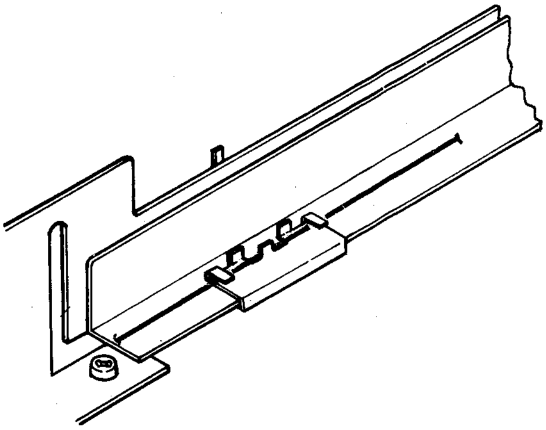


Fig. 2-11-5 Dial Pointer Detail

SECTION 3

TEST AND ALIGNMENT

FM Section

Caution: Never attempt alignment of the Front End section except for the frequency coverage and dial calibration adjustments. Factory adjustments are extremely stable and should not be reset except in unusual condition. The alignment should not be performed when the Front End FET s have been replaced as changes in FET parameters have little effect upon tuning. In case an rf stage adjustment is required, ask your nearest SONY Service Station for the complete Front End alignment to be performed at the Factory Service Center. Exercise caution when returning the faulty unit so that it is not damaged in transit. SONY cannot assume liability in the event of such damage.

3-1 Front End Alignment

Note: Discriminator alignment should be performed first.

Test Equipments Required:

(1) FM Standard Signal Generator (SSG).
If such a generator is unavailable, an off-the-air signal at the lowest and highest ends of the band will be acceptable.
(2) Dummy Antenna See Fig. 3-1-1.
(3) AC VTVM
(4) Alignment Tools

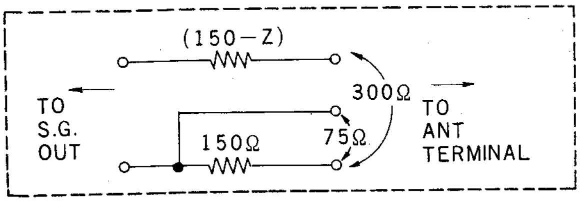


Fig. 3-1-1 Dummy Antenna

Preparation

(1) Remove the chassis cover.
(2) Connect the equipment as shown in Fig. 3-1-2.
(3) Loosen the set screw on the mechanical stopper mechanism at the front end shaft of the tuning capacitor. See Fig. 3-1-3.

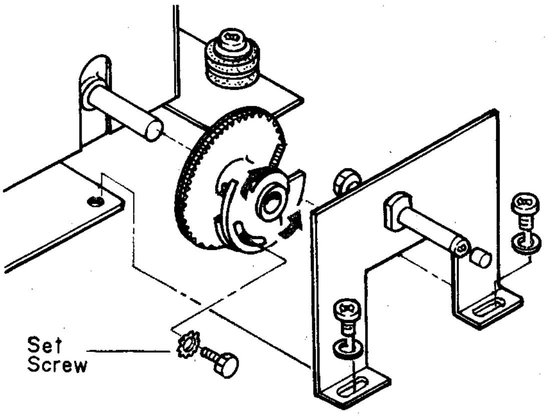


Fig. 3-1-3 Stopper Mechanism Detail

(4) After the frequency coverage adjustment is completed, adjust the mechanical stopper so that the pointer does not move more than 1/8 inches to the left of the 87 MHz mark. The hex-head screw on the stopper can be turned with a pair of long-nosed pliers.
(5) Set the controls as follows:
FUNCTION Selector..................TUNER
VOLUME Control ....MIN
MODE Switch ....STEREO
MONITOR Switch.....................SOURCE
Follow the procedures given in Table 1 on next page.

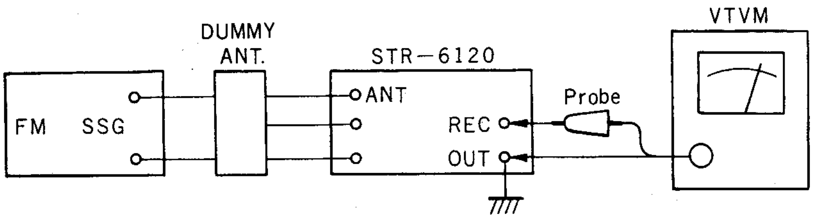


Fig. 3-1-2 Front End Alignment Test Set-up

TABLE 1

Frequency Coverage and Dial Calibration

Coupling between Front End and SSG	SSG Frequency and output level	Tuning Capacitor	AC VTVM connection	Adjust	Indication
Dummy Antenna Fig. 3-1-1	86 MHz 400 Hz, 30% Mod 20 dB/μ	Maximum Capacitance position	REC OUT J 103	OSC Coil L 105 Fig. 3-1-4	Maximum VTVM reading
Same as above	109.5 MHz 400 Hz, 30% Mod 20 dB/μ	Minimum Capacitance position	Same as above	OSC Trimmer CT 105 Fig. 3-1-4	Same as above

Note: Repeat the foregoing procedures several times until an accurate dial calibration is obtained

Suggestion:

Accurate dial calibration or frequency coverage can be performed also by utilizing off-the-air local FM stations as follows.

Procedure:

(1) Tune the set to the lowest-frequency station.
(2) Check that the pointer stays on the dial within a limit of ±100 kHz from the carrier frequency of that station. If the dial deviation exceeds the above mentioned limit, adjust the local oscillator coil L105 slightly until optimum dial calibration is obtained.
(3) Tune the set to the highest-frequency station. If the dial calibration error is excessive, adjust local oscillator trimmer CT105 to obtain minimum dial deviation.

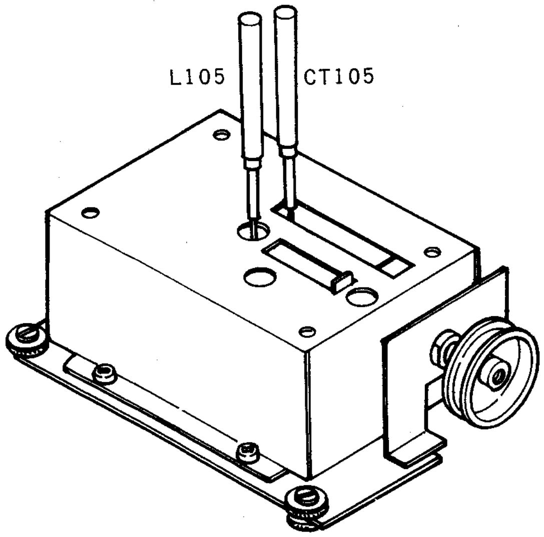


Fig. 3-1-4 Front End Alignment

3-2 FM Discriminator Adjustment

Caution: This is a preadjustment procedure for the discriminator section. To obtain optimum operation of the discriminator, follow the OVERALL ADJUSTMENT procedure Section 4-1 Monaural Distortion described on page 19.

Test Equipments Required:

(1) 10.7 MHz Sweep Generator
    Center frequency ....8 to 12 MHz (variable)
    Sweep width ....1 MHz or more
    Output impedance ....50 or 75 ohms
(2) Oscilloscope
    Vertical sensitivity.........at least 10 mV/cm
    CRT diameter...............5″ or more
(3) Alignment Tools

Preparation:

(1) Remove the chassis cover.
(2) Unsolder the coaxial cable from the input terminal of the I-F section.
(3) Unsolder the coaxial cable from the output terminal of the Limiter and Detector section.
(4) Connect 0.02μF ceramic capacitors across the input terminal of the I-F section and the output terminal of the Limiter and Detector section.

Procedures:

(1) With the equipment connected as shown in Fig. 3-2-1, set the 10.7-MHz Sweep Generator and receiver controls as follows:
    Center Frequency ....10.7 MHz
    Sweep Width ....1.0 MHz
    Output Level ....10 dB/μ
    VOLUME Control ....Minimum
    FUNCTION Selector..................TUNER
    MODE Selector ....STEREO

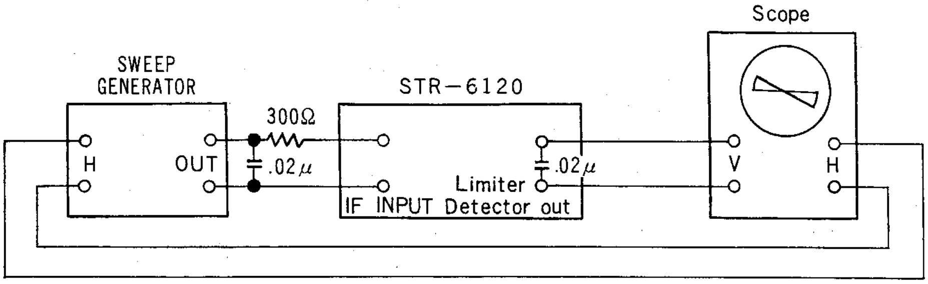

Scope
SWEEP GENERATOR
STR-6120
300Ω
H
OUT
.02μ
.02μ
Limiter
IF INPUT Detector out
V
H

Fig. 3-2-1 FM Discriminator Adjustment Test Set-up

(2) Adjust the scope controls to provide a visible indication.

Caution: Two or three outputs will be observed on the scope as the center frequency of the sweep generator varies ±1 to 2 MHz. The output you are looking for has the largest amplitude. Once you get this curve, decrease the sweep generator output as low as possible.

(3) Turn the top core of IFT301 with the hexagonal-head alignment tool to obtain an " S " curve response as shown in Fig. 3-2-2.

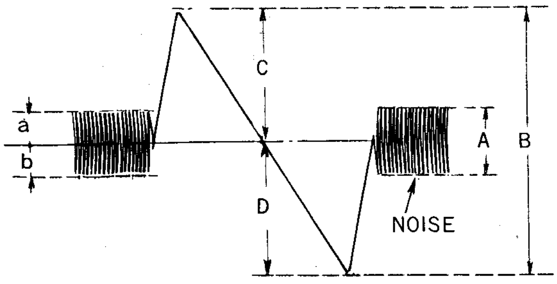

C
a
b
A
B
D
NOISE

Fig. 3-2-2 " S " Curve Response

(4) Turn the bottom core of IFT_{301} to obtain maximum response.

(5) Detune the top core in both directions to obtain maximum positive and negative output as shown in Fig. 3-2-3. Adjust R_{319} (5k-B), the DC Balance, to obtain equal response when the core is peaked to provide either maximum negative or maximum positive output as shown in Fig. 3-2-3.

(6) Reset the top core of IFT_{301} to equalize negative and positive peaks, as shown in Fig. 3-2-2 (C=D=1/2B)

(7) Make sure that the " S " curve does not change when the shunting capacitor is removed from the input of the I-F section.

(8) Disconnect the sweep generator and make sure that the scope displays only noise.

(9) Turn IFT301 top core slightly to make the tuning meter indicate the null point (center scale).

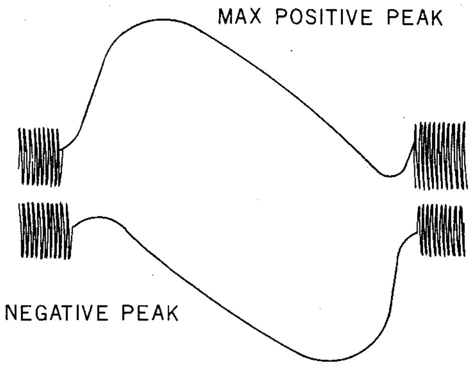

MAX POSITIVE PEAK
NEGATIVE PEAK

Fig. 3-2-3 " S " Curves at Peak

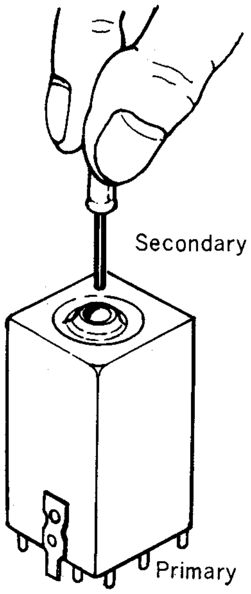

Secondary
Primary

Fig. 3-2-4 FM Discriminator Transformer

SECTION 4

OVERALL ADJUSTMENTS AND TESTS

These "touch-up" adjustments ensure optimum performance.
They also assist in locating troubles.

Test Equipments Required:

(1) Standard FM Signal Generator (SSG).
(2) MPX Stereo Signal Generator
(3) Audio Oscillator
(4) Distortion Meter with AC VTVM
(5) Dummy Antenna (See Fig. 3-1-1).
(6) Oscilloscope
(7) Alignment Tools

Caution: Discriminator Transformer Adjustment should come to first before performing any adjustments.

4-1 Monaural Distortion

(1) Connect the equipment as shown in Fig. 4-1-1.
(2) Set the FM Signal Generator Frequency to 98 MHz, 400Hz, 100% modulation.
Output level: 60 dB/μ
(3) Tune the receiver to 98 MHz and adjust the bottom core of IFT_{301}, the Discriminator Transformer, slightly for minimum distortion.

4-2 Stereo Distortion

Note: Before starting MPX decoder check and adjustment, check the phase between the pilot signal (19 kHz) and sub carrier (38 kHz) signal, as follows:

(a) Connect the MPX Stereo Generator and oscilloscope as shown in Fig. 4-2-1.

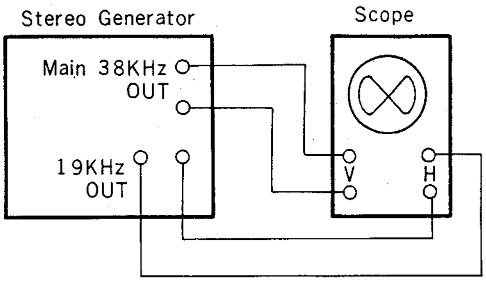

Stereo Generator
Scope
Main 38KHz
OUT
19KHz
OUT
V
H

Fig. 4-2-1 Stereo Generator Phase Check Test

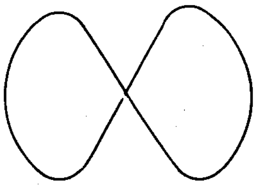


Fig. 4-2-2 Lissajous Pattern

(b) Adjust the output phase of the 19 kHz pilot signal to obtain the stable Lissajous pattern shown in Fig. 4-2-2.

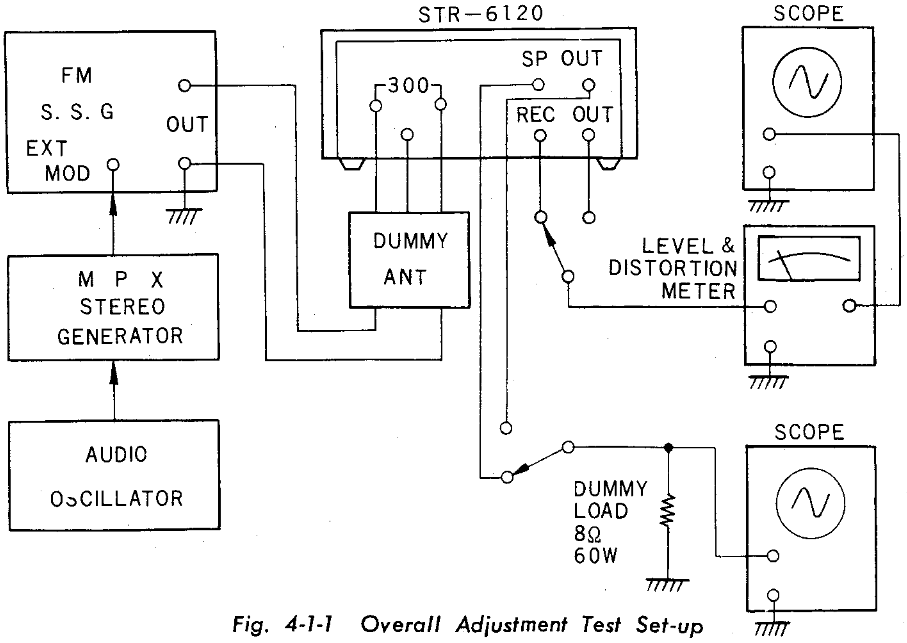

STR-6120
SCOPE
FM
S. S. G
OUT
EXT
MOD
300
SP OUT
REC OUT
M P X
STEREO
GENERATOR
DUMMY
ANT
LEVEL &
DISTORTION
METER
AUDIO
OSCILLATOR
SCOPE
DUMMY
LOAD
8Ω
60W

Fig. 4-1-1 Overall Adjustment Test Set-up

(1) Connect the equipment as shown in Fig. 4-1-1; set the FM signal generator as follows:
Carrier Frequency ....98 MHz
Output Level........................60 dB/μ
Modulation :
Main Channel (400 Hz) ....45% (33.75 kHz)
Sub Channel (38 kHz) ....45% (33.75 kHz)
Pilot Signal (19 kHz) ....10% (7.5 kHz)
Above mentioned modulation can be set up as follows:

(a) With the equipment connected as shown in Fig. 4-1-1, set the MPX stereo generator controls as follows.
MAIN CHANNEL ....OFF
SUB CHANNEL ....OFF
19 kHz (PILOT)...........................ON

(b) Adjust the MPX generator output level to obtain a 7.5 kHz deviation on the FM SSG modulation meter.

(c) Reset the MPX stereo generator controls as follows:
MAIN CHANNEL ....ON
SUB CHANNEL ....OFF
19 kHz (PILOT)...........................OFF

(d) Adjust the audio oscillator output control to obtain a 33.75 kHz deviation on the FM SSG modulation meter.

(e) Set all the controls to the ON position.

(2) Check the distortion in each channel.
Adjust L504, the switching transformer, in the MPX Decoder section with a non-metalic alignment tool to obtain minimum distortion. See Fig. 4-2-3.

Note: Transformer Cap can be removed by softening the cement at its base.

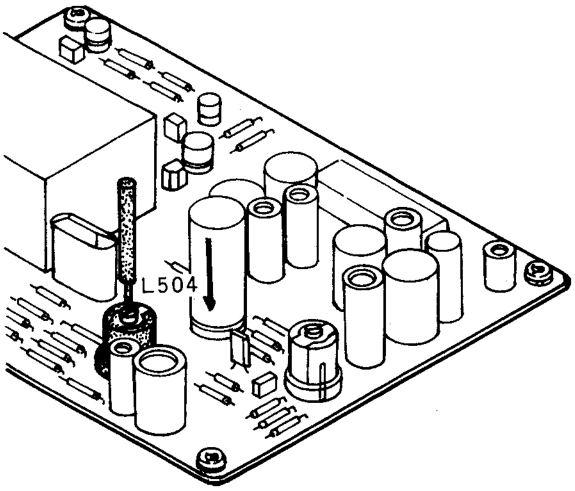


Fig. 4-2-3 Stereo Distortion Adjustment

4-3 Channel Separation

(1) With the equipment connected as shown in Fig. 4-1-1, set the signal generator's controls to the same positions as described in the Stereo Distortion check.

(2) Check channel separation as follows:
Record the output level of the left channel when the MPX generator input selector is set to the left channel. Switch the input selector to the right channel, and check the residual signal in the left channel. The residual signal ratio represents the separation. Adjust R537 (5k-B), the Separation Adj., to obtain minimum residual level on the MPX Decoder board. Check the right channel separation.
Usually there exisists about an 8 to 9 dB difference after performing above mentioned procedures. Re-adjust the R$_{537}$ for minimum difference between left and right separation.

Note: The output level changes according to the setting of R$_{537}$.

4-4 Muting Circuit Adjustment

Adjustment Procedure:

(1) Muting Level Adjustment

(a) With the equipment connected as shown in Fig. 4-1-1, set the FM signal generator as follows:
Carrier Frequency ....98 MHz
Output Level.....................20 dB/μ
Modulation (400 Hz) ....100% (75 kHz)

(b) Tune the set and adjust the semifixed resistor R$_{211}$ (330Ω) on the I-F board until the output is muted when the signal output level is decreased to 15±3 dB/μ. Normally R$_{211}$ is turned fully clockwise.

(c) If the muting circuit does not operate properly, check the related circuitries.

(2) Muting Level Calibration in the Detuned Condition
Readjustment is necessary after replacing Q$_{401}$ (FET) or if the tuning meter deflection is unblanced when detuning +Δf, −Δf respectively. The relations between the "S" curve, muting level and tuning meter deflection are shown in Fig. 4-4-1.

Adjustment Procedure:

(a) With the equipment connected as shown in Fig. 4-1-1, set the FM signal generator and receiver controls as follows:
Carrier Frequency ....98 MHz
Output Level...........................60 dB/μ
Modulation (400 Hz) ....100% (75 kHz)
VOLUME Control ....Minimum
FUNCTION Selector ....TUNER,
MODE Selector........................STEREO
MUTING Switch ....IN
MONITOR Switch ....SOURCE

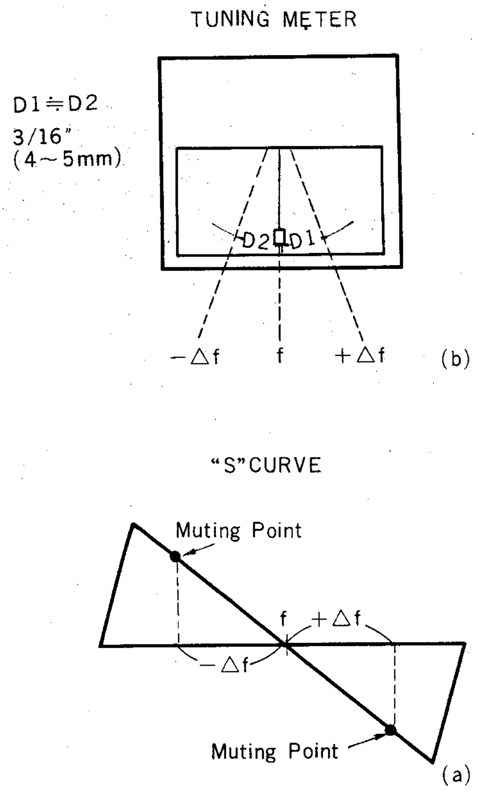


Fig. 4-4-1 Relation between " S " Curve, muting level and tuning meter deflection

(b) Tune the set and shift the tuning frequency higher and lower respectively until the muting circuit begins to operate and note the deflection of the tuning meter. Deflection of the tuning meter should be within a limit of 3/16″ (4-5mm) off position from the tuning meter's null point. In case the difference between D_1 and D_2 is too great, the adjustment is required.

Procced as follows:

(c) In case $D_1 \gg D_2$
Increase the value of R_{403} (turn it counterclockwise) to obtain a proper response on the tuning meter. See Fig. 4-4-1.

(d) In case $D_1 \ll D_2$
Decrease the value of R_{403} (turn it clockwise) to obtain a proper response on the tuning meter.

4-5 Tuner Input-Meter Calibration

(1) With the equipment connected as shown in Fig. 4-1-1, set the FM signal generator and receiver's controls as follows:

Carrier Frequency	98 MHz
Output Level	60 dB/μ
Modulation (400 Hz)	100% (75 kHz)
VOLUME Control	Minimum
FUNCTION Selector	TUNER
MODE Selector	STEREO
MONITOR Switch	SOURCE

(2) Tune the set and adjust R251 (1 kΩ), the Meter Calibration, to get the meter pointer to 1/16″ (2 mm) left of its maximum indication. See Fig. 4-5-1.

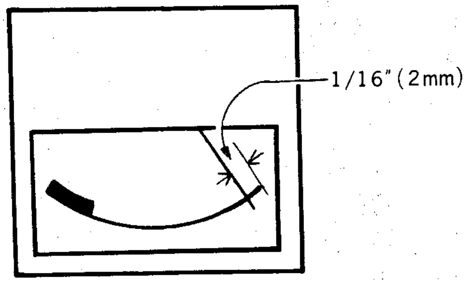


Fig. 4-5-1 Tuner Input Meter Calibration

4-6 Dial Pointer Adjustment

(1) Under the same conditions as described in Section 4-5, except that the carrier frequency is crystal calibrated and output level is 20 dB/μ, tune the set precisely to the 98 MHz signal.

(2) Set the pointer to 98 MHz on the dial.
Apply a drop of contact cement to the tabs on the rear of the dial pointer.

4-7 Power Amplifier Adjustment

Note: To simplify the following description, only the left channel and its related circuitries are described. The right channel is identical except for reference symbol numbers (See schematic diagram).

This adjustment should be done each time after replacing any transistors removed from the Power Amplifier section.

Caution: To avoid accidental transistor damage, increase the ac line voltage gradually, using the variable transformer, while checking the voltage between the collector of Q_{808} and ground. Check the reading does not exceed 0.6 volts.

Preparation:

Set the controls as follows:

VOLUME Control	Fully counterclockwise
MODE Switch	STEREO
SPEAKER Switch	MAIN
LOUDNESS Switch	OUT
TONE Controls	0 dB
MONITOR Switch	TAPE

(A) Dc Bias Adjustment

Caution: Serious deficiencies in performance, such as thermal runaway of the power transistors will result if this adjustment is set improperly.

1. Connect the dc volt meter between the emitter of Q_{610} and ground as shown in Fig. 4-7-1.
2. Turn on the power switch. Then, adjust R_{813} (10KΩ-B) to obtain a 12 mV reading on the meter.

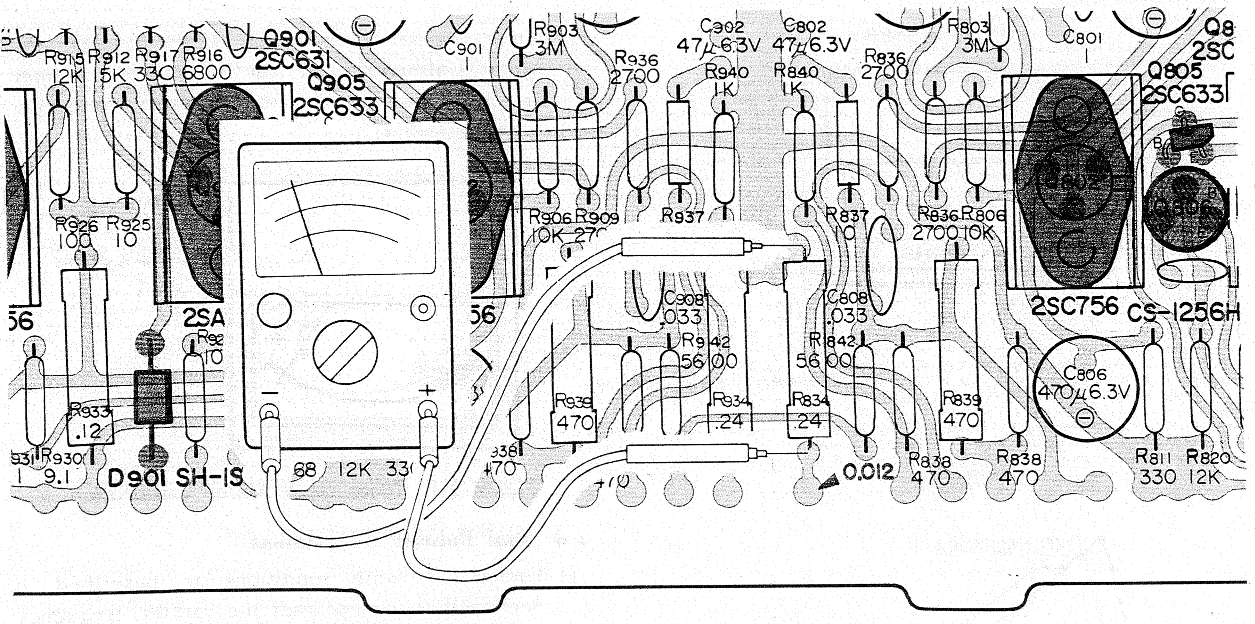

Q901
2SC631
R915 12K
R912 15K
R917 330
R916 6800
Q905
2SC633
C901 1
R903 3M
R936 2700
C902 47μ 6.3V
C802 47μ 6.3V
R940 1K
R840 1K
R836 2700
R803 3M
C801 1
Q805
2SC633
R926 100
R925 10
R906 10K
R909
R937
R837 10
R836 2700
R806 10K
2SA
C908 .033
C808 .033
R942 5600
R842 5600
2SC756
CS-1256H
C806 470μ6.3V
R939 470
R934 .24
R834 .24
R839 470
R933 .12
R930 9.1
D901 SH-1S
68
12K
0.012
R838 470
R811 330
R820 12K

Fig. 4-7-1 DC Bias Adjustment Test Set-up

(B) Ac Balance Adjustment

Caution: Serious deficiencies in harmonic distortion at high levels will result if this adjustment is set improperly.

1. With the equipment connected as shown in Fig. 4-1-1 and the power switch is in the ON position, feed a 1 kHz 0 dB signal to the TAPE input terminal through the attenuator.
2. Turn the volume control gradually and watch the waveform on the oscilloscope. Adjust R_{805} (50 kΩ-B) to obtain an output waveform such as the positive and negative peaks are clipped at the same time when increasing the volume control. See Fig. 4-7-2.

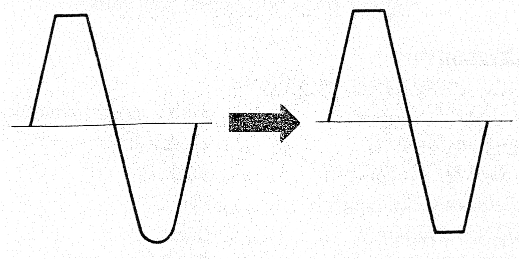


Fig. 4-7-2 AC Balance Adjustment

(C) Thermal Sensitivity Protection Circuit Check

Step 1: With the equipment connected as shown in Fig. 4-1-1. Feed a 1 kHz signal to the TAPE input terminal through the attenuator.

Step 2: Increase signal level to obtain 500 mW output (2.0 Vrms across an 8 ohm load).

Step 3: Insert a thermometer between the power transistor and CS_1. Heat the power transistor and CS_1 gradually using a heat blower, as shown in Fig. 4-7-3.
A conventional hair dryer is acceptable.

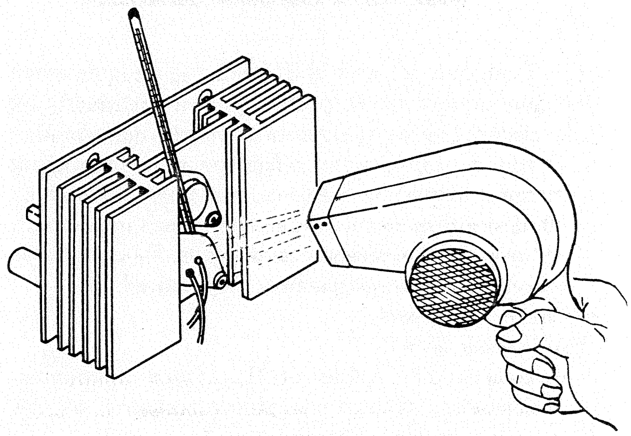


Fig. 4-7-3 Thermal Sensitive Protection Check

Step 4: Confirm that the output of the amplifier is decreased when temperature reaches 158°±9°F. (70±5°C) See Fig. 4-7-4.
If the protection circuit does not operate properly, check the related circuitry.

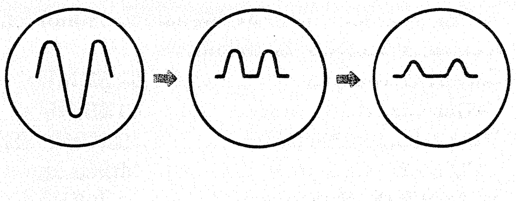
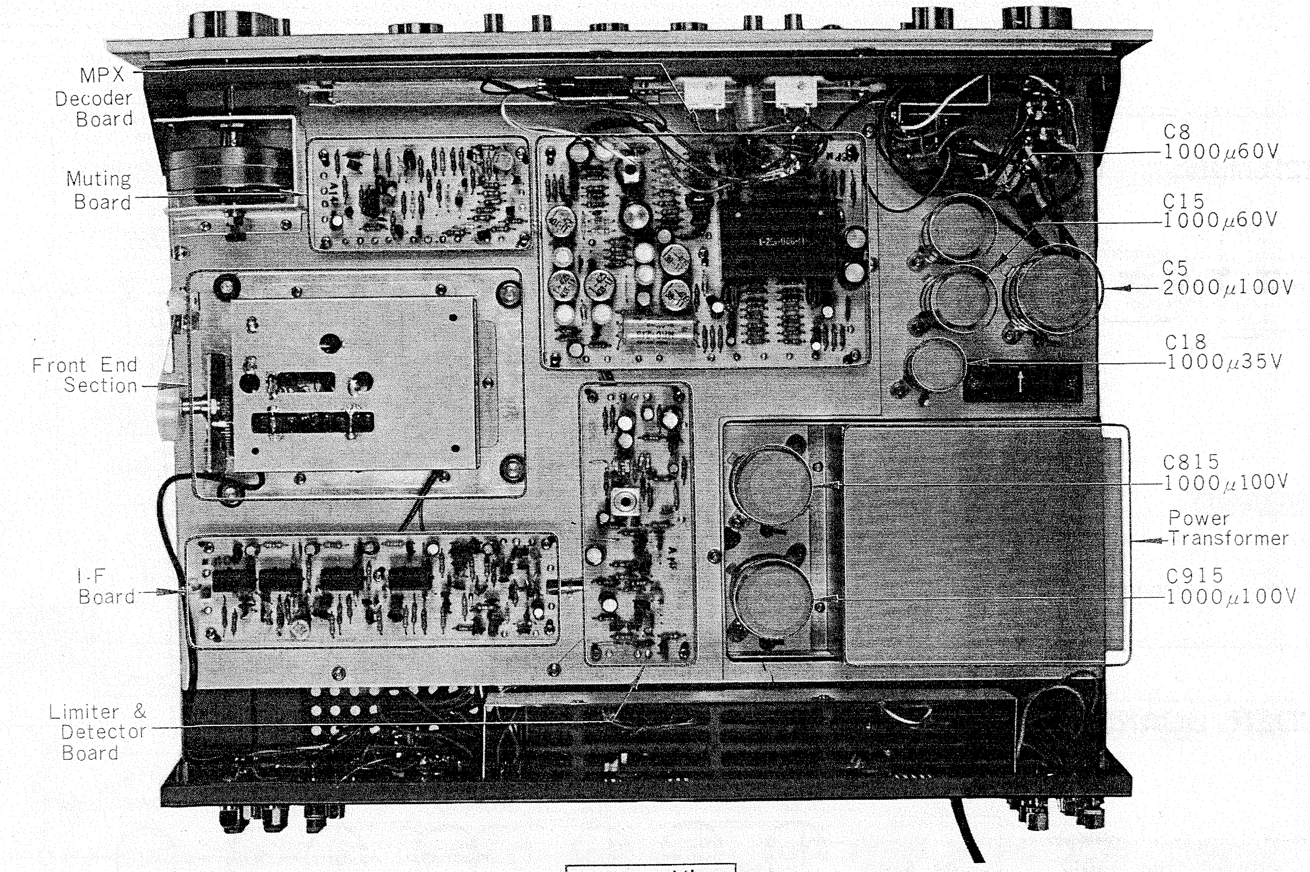


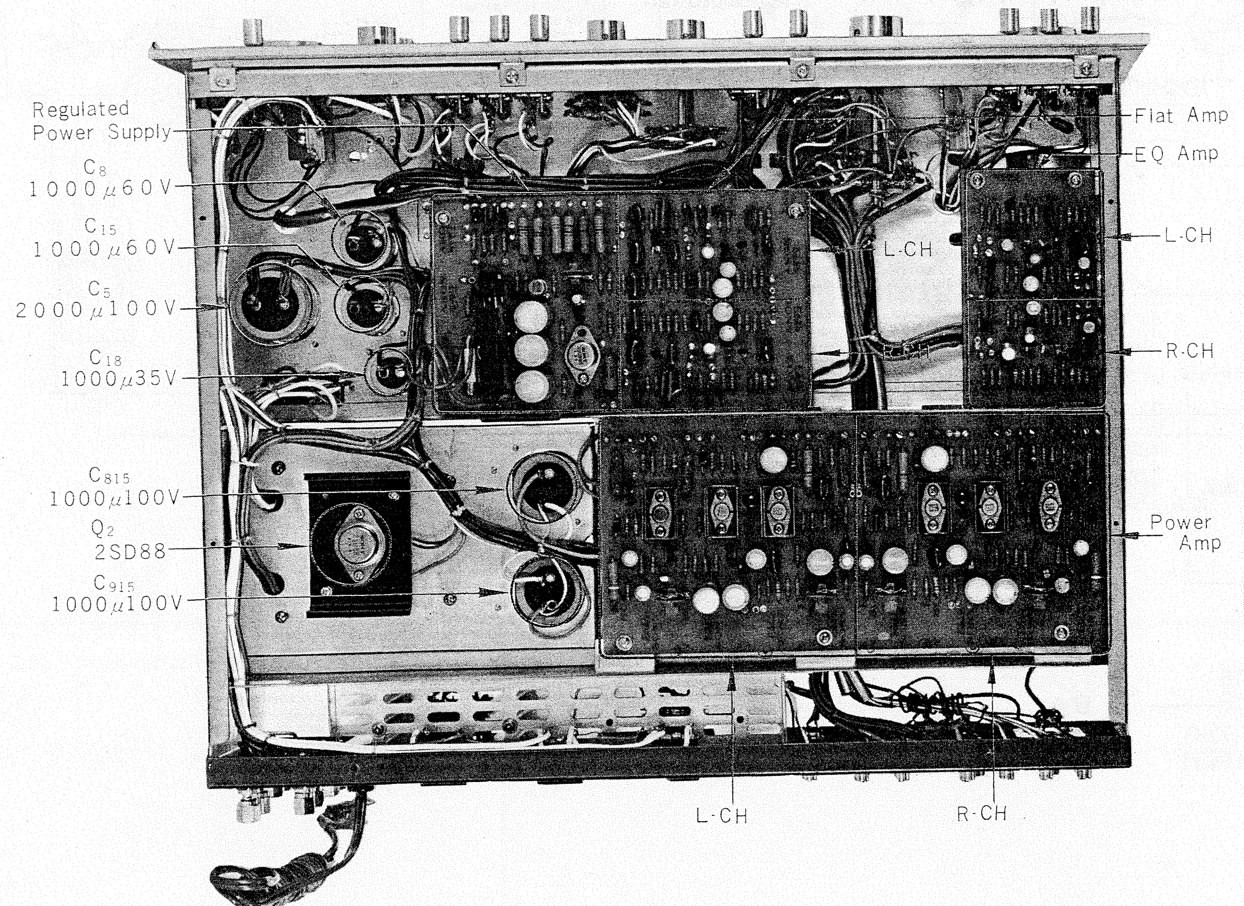
Fig. 4-7-4 Output Wave Forms when thermal protection circuit is actuated

Chassis Layout

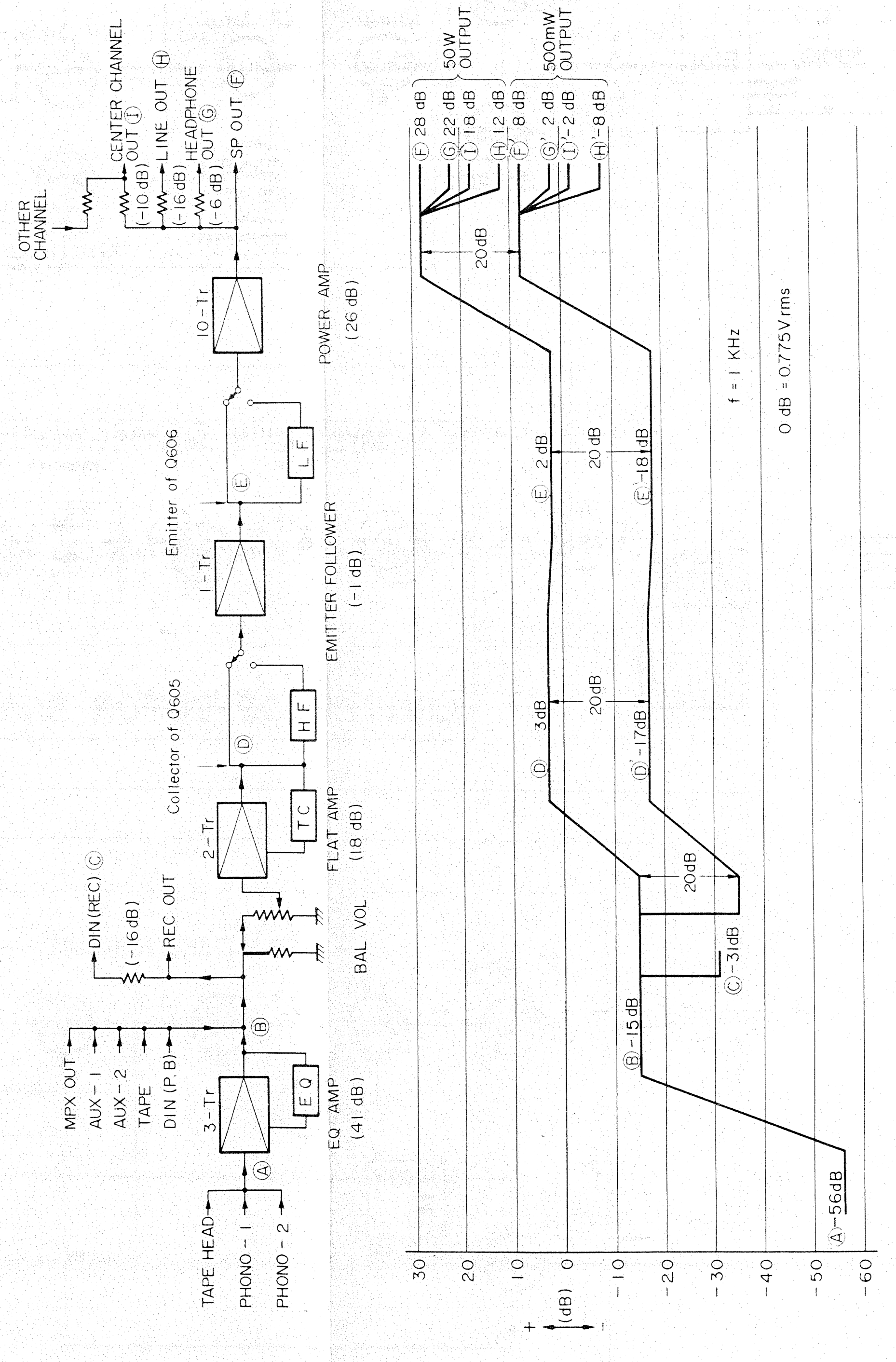
Top View


MPX Decoder Board
Muting Board
Front End Section
I-F Board
Limiter & Detector Board
C8 1000μ60V
C15 1000μ60V
C5 2000μ100V
C18 1000μ35V
C815 1000μ100V
Power Transformer
C915 1000μ100V

Bottom View

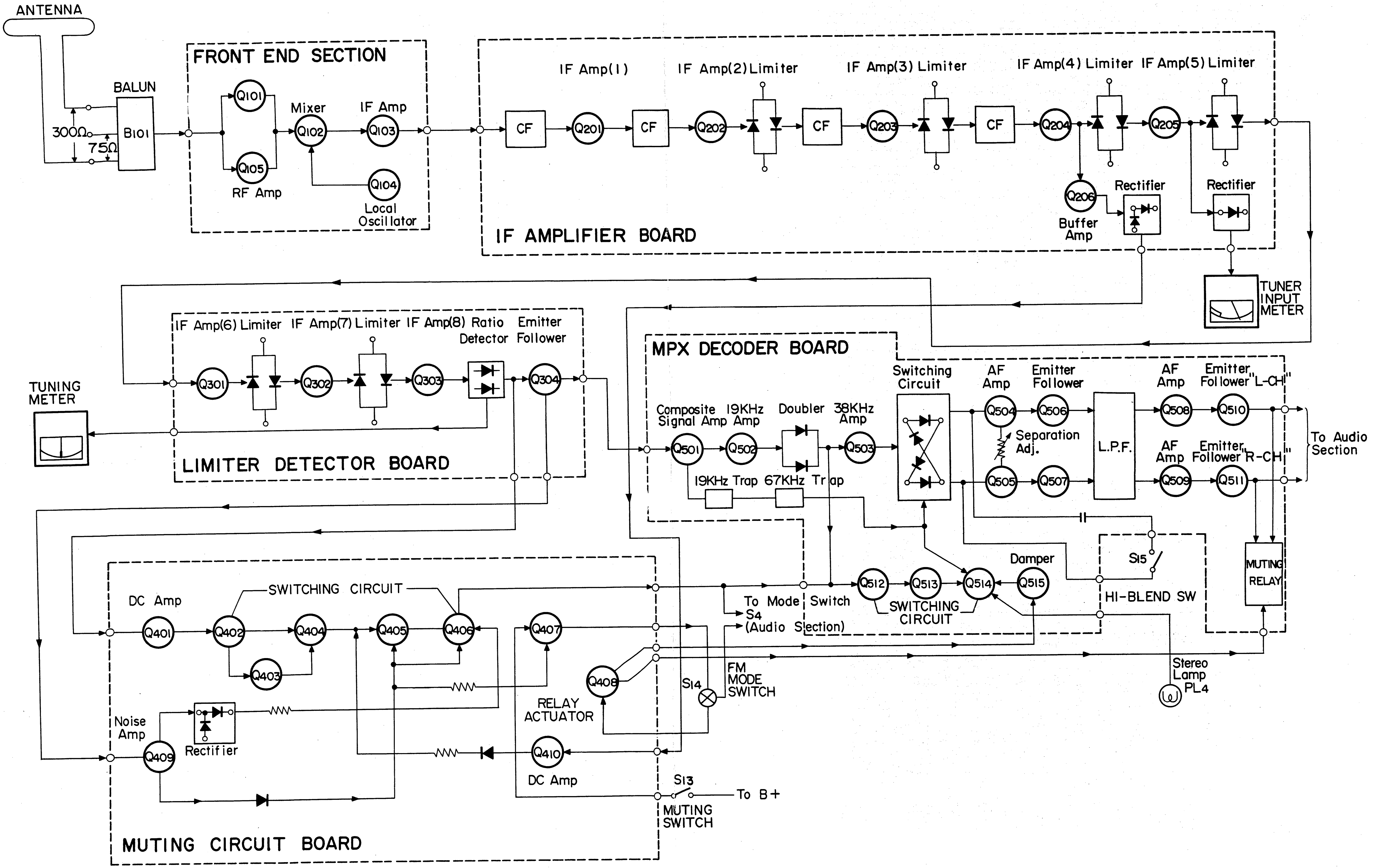

Regulated Power Supply
C8 1000μ60V
C15 1000μ60V
C5 2000μ100V
C18 1000μ35V
C815 1000μ100V
Q2 2SD88
C915 1000μ100V
Flat Amp
EQ Amp
L-CH
L-CH
R-CH
Power Amp
L-CH
R-CH

Level Diagram


TAPE HEAD
PHONO-1
PHONO-2
Ⓐ
3-Tr
EQ
EQ AMP (41 dB)
MPX OUT
AUX-1
AUX-2
TAPE
DIN (P.B)
Ⓑ
DIN (REC) Ⓒ
(-16dB)
REC OUT
BAL VOL
2-Tr
TC
FLAT AMP (18 dB)
Collector of Q605
Ⓓ
HF
1-Tr
EMITTER FOLLOWER (-1 dB)
Emitter of Q606
Ⓔ
LF
10-Tr
POWER AMP (26 dB)
OTHER CHANNEL
CENTER CHANNEL OUT Ⓘ
(-10 dB)
LINE OUT Ⓗ
(-16 dB)
HEADPHONE OUT Ⓖ
(-6 dB)
SP OUT Ⓕ
Ⓕ 28 dB
Ⓖ 22 dB
Ⓘ 18 dB
Ⓗ 12 dB
50W OUTPUT
Ⓕ' 8 dB
Ⓖ' 2 dB
Ⓘ' -2 dB
Ⓗ' -8 dB
500mW OUTPUT
20dB
Ⓔ 2dB
20dB
Ⓔ' -18dB
Ⓓ 3dB
20dB
Ⓓ' -17dB
20dB
Ⓒ -31dB
Ⓑ -15dB
Ⓐ -56dB
f = 1 KHz
0 dB = 0.775Vrms
30
20
10
0
-10
-20
-30
-40
-50
-60
+ (dB) -

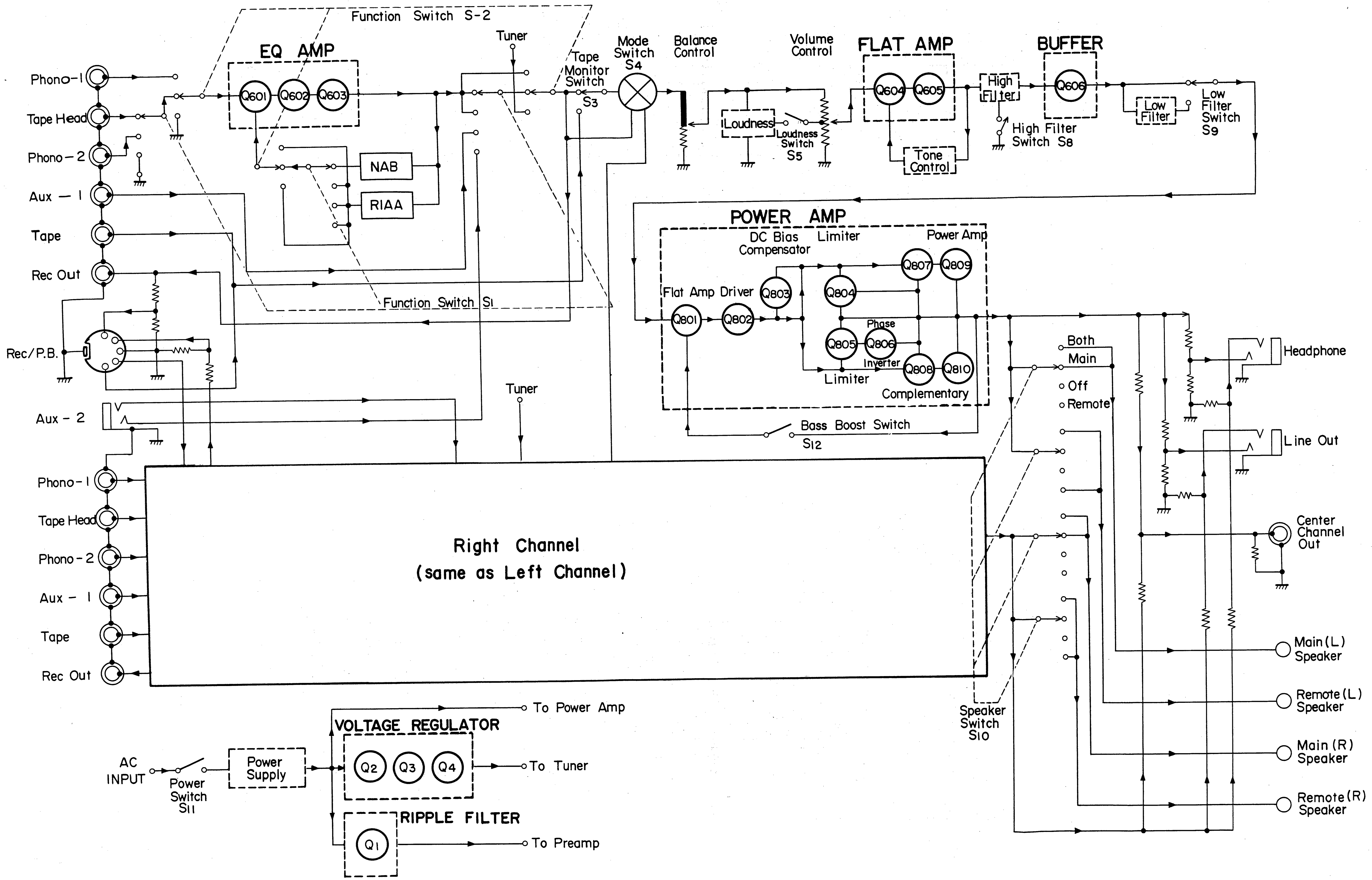
Block Diagram

TUNER SECTION


ANTENNA
BALUN
300Ω
75Ω
B101
FRONT END SECTION
Q101
Q105
RF Amp
Mixer
Q102
IF Amp
Q103
Q104
Local Oscillator
IF Amp(1)
IF Amp(2) Limiter
IF Amp(3) Limiter
IF Amp(4) Limiter
IF Amp(5) Limiter
CF
Q201
CF
Q202
CF
Q203
CF
Q204
Q205
Q206
Buffer Amp
Rectifier
Rectifier
IF AMPLIFIER BOARD
TUNER INPUT METER
IF Amp(6) Limiter
IF Amp(7) Limiter
IF Amp(8)
Ratio Detector
Emitter Follower
Q301
Q302
Q303
Q304
TUNING METER
LIMITER DETECTOR BOARD
MPX DECODER BOARD
Composite Signal Amp
19KHz Amp
Doubler
38KHz Amp
Q501
Q502
Q503
19KHz Trap
67KHz Trap
Switching Circuit
AF Amp
Emitter Follower
Q504
Q506
Separation Adj.
Q505
Q507
L.P.F.
AF Amp
Emitter Follower "L-CH"
Q508
Q510
AF Amp
Emitter Follower "R-CH"
Q509
Q511
To Audio Section
Damper
Q512
Q513
Q514
Q515
SWITCHING CIRCUIT
S15
HI-BLEND SW
MUTING RELAY
To Mode Switch
S4
(Audio Section)
Stereo Lamp
PL4
DC Amp
SWITCHING CIRCUIT
Q401
Q402
Q403
Q404
Q405
Q406
Q407
Q408
RELAY ACTUATOR
S14
FM MODE SWITCH
Noise Amp
Q409
Rectifier
Q410
DC Amp
S13
To B+
MUTING SWITCH
MUTING CIRCUIT BOARD

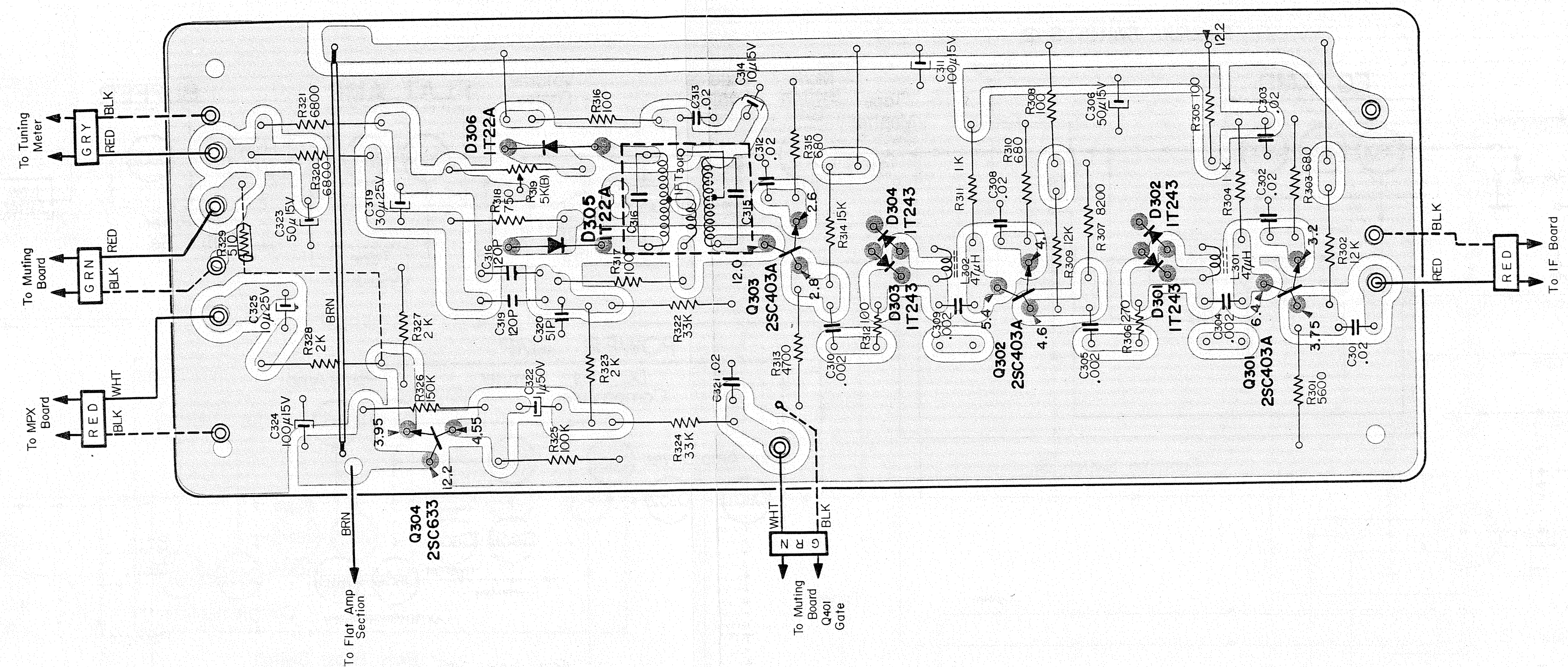
Block Diagram

AUDIO AMPLIFIER SECTION

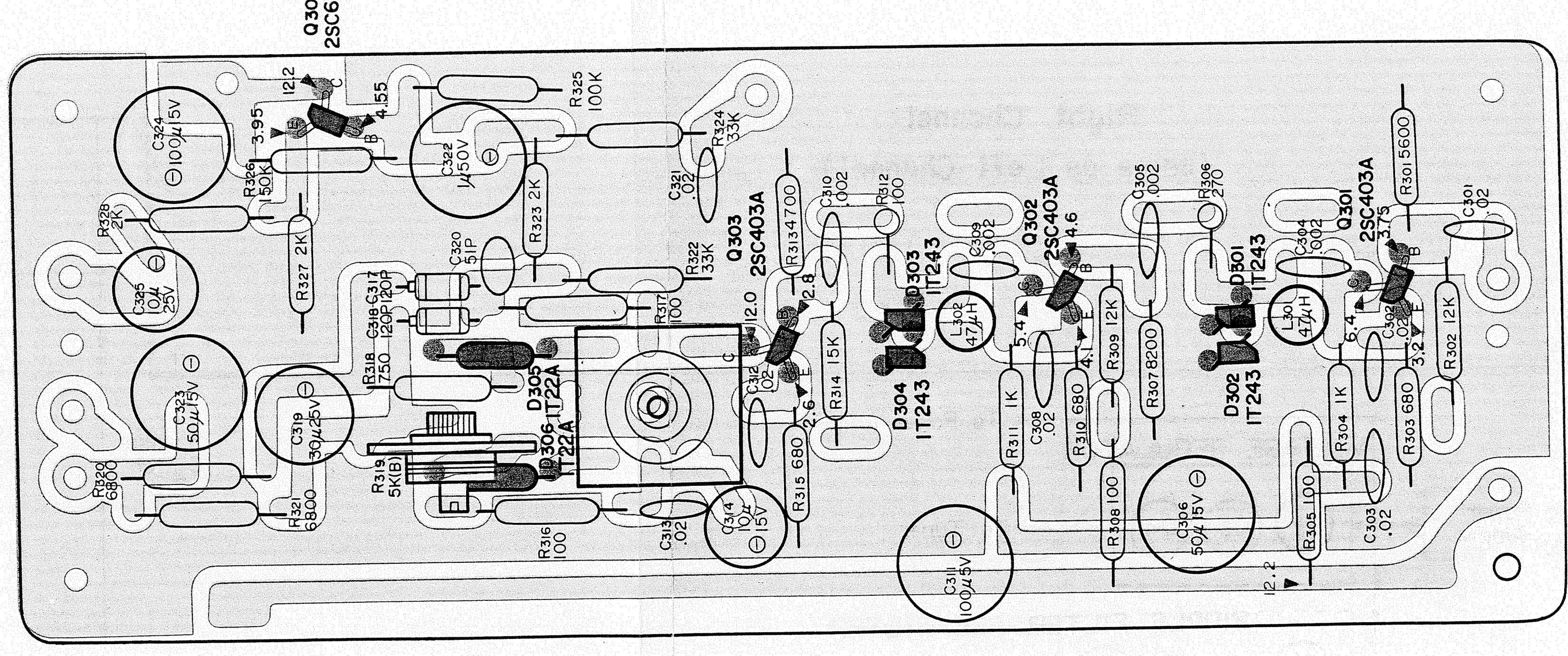

Function Switch S-2
Tuner
EQ AMP
Q601
Q602
Q603
Tape Monitor Switch
S3
Mode Switch
S4
Balance Control
Volume Control
FLAT AMP
Q604
Q605
High Filter
BUFFER
Q606
Low Filter
Low Filter Switch
S9
High Filter Switch S8
Loudness
Loudness Switch
S5
Tone Control
Phono-1
Tape Head
Phono-2
Aux-1
Tape
Rec Out
NAB
RIAA
Rec/P.B.
Function Switch S1
POWER AMP
DC Bias Compensator
Limiter
Power Amp
Flat Amp Driver
Q801
Q802
Q803
Q804
Q805
Q806
Q807
Q808
Q809
Q810
Phase Inverter
Limiter
Complementary
Bass Boost Switch
S12
Both
Main
Off
Remote
Headphone
Line Out
Center Channel Out
Aux-2
Tuner
Phono-1
Tape Head
Phono-2
Aux-1
Tape
Rec Out
Right Channel
(same as Left Channel)
Main (L) Speaker
Remote (L) Speaker
Main (R) Speaker
Remote (R) Speaker
Speaker Switch
S10
To Power Amp
VOLTAGE REGULATOR
Q2
Q3
Q4
To Tuner
AC INPUT
Power Switch
S11
Power Supply
RIPPLE FILTER
Q1
To Preamp

Mounting Diagram

Limiter and Detector Section


To Tuning Meter
GRY
RED
BLK
To Muting Board
GRN
To MPX Board
WHT
To Flat Amp Section
BRN
To Muting Board Q401 Gate
To IF Board
Q304 2SC633
Q303 2SC403A
Q302 2SC403A
Q301 2SC403A
D306 IT22A
D305 IT22A
D304 IT243
D303 IT243
D302 IT243
D301 IT243
IFT301
R321 6800
R320 6800
R329 510
R328 2K
R327 2K
R326 150K
R325 100K
R324 33K
R323 2K
R322 33K
R318 750
R319 5K(B)
R316 100
R315 680
R314 15K
R313 4700
R312 100
R311 1K
R310 680
R309 12K
R308 100
R307 8200
R306 270
R305 100
R304 1K
R303 680
R302 12K
R301 5600
C325 10μ25V
C324 100μ15V
C323 50μ15V
C322 1μ50V
C321 .02
C320 51P
C319 30μ25V
C317 120P
C316 120P
C314 10μ15V
C313 .02
C312 .02
C311 100μ15V
C310 .002
C309 .002
C308 .02
C306 50μ15V
C305 .002
C304 .002
C303 .02
C302 .02
C301 .02
L302 47μH
L301 47μH
3.95
4.55
12.2
12.0
2.8
2.6
5.4
4.6
4.1
6.4
3.75
3.2

Conductor Side

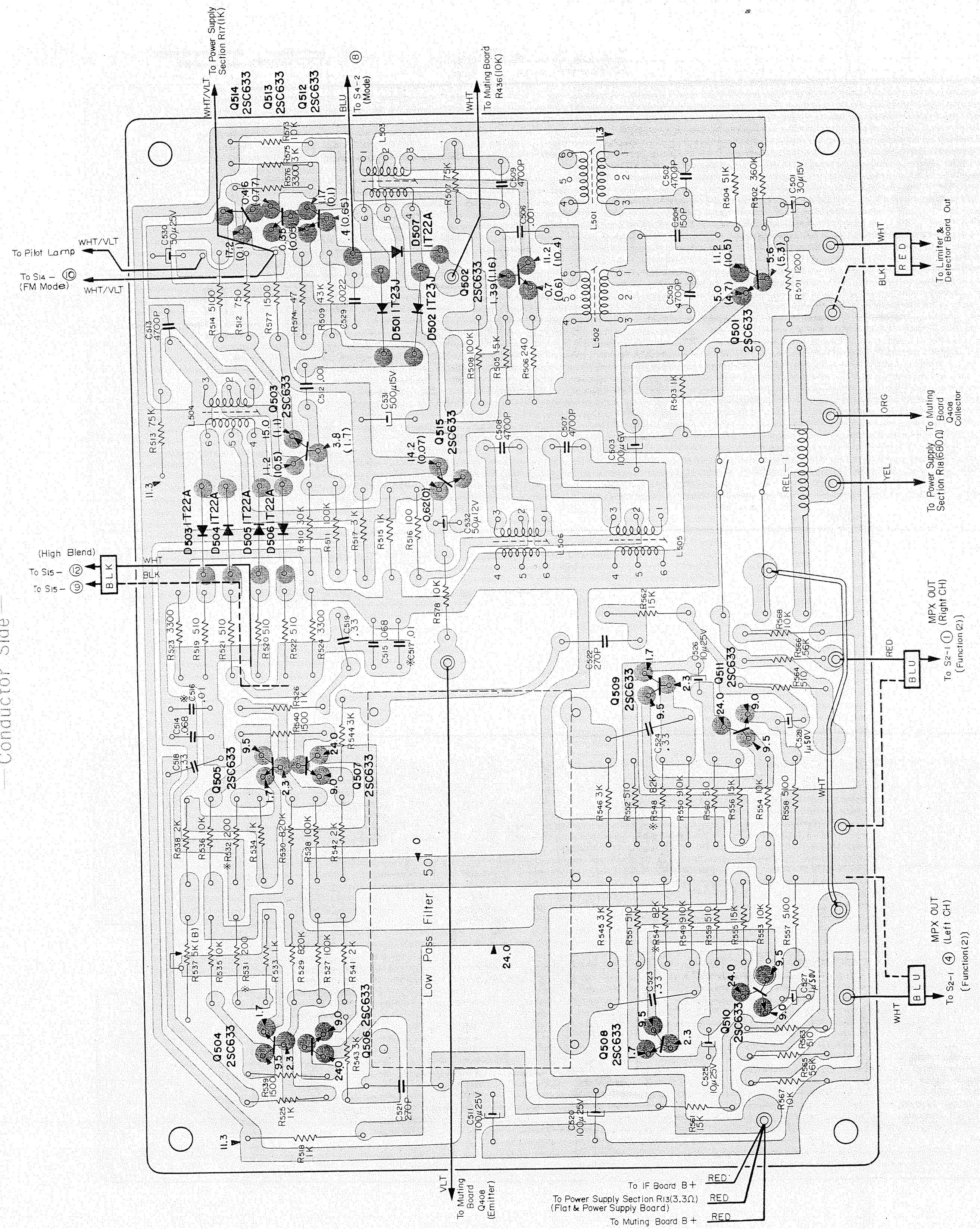

Q304 2SC633
Q303 2SC403A
Q302 2SC403A
Q301 2SC403A
D306 IT22A
D305 IT22A
D304 IT243
D303 IT243
D302 IT243
D301 IT243
R325 100K
R324 33K
R326 150K
R328 2K
R327 2K
R323 2K
R322 33K
R317 100
R313 4700
R312 100
R314 15K
R315 680
R316 100
R321 6800
R320 6800
R318 750
R319 5K(B)
R311 1K
R310 680
R309 12K
R308 100
R307 8200
R306 270
R305 100
R304 1K
R303 680
R302 12K
R301 5600
C324 100μ15V
C325 10μ 25V
C323 50μ15V
C322 1μ50V
C321 .02
C320 51P
C319 30μ25V
C318 120P
C317 120P
C314 10μ 15V
C313 .02
C312 .02
C311 100μ15V
C310 .002
C309 .002
C308 .02
C306 50μ15V
C305 .002
C304 .002
C303 .02
C302 .02
C301 .02
L302 47μH
L301 47μH
12.2
3.95
4.55
12.0
2.8
2.6
5.4
4.6
4.1
6.4
3.75
3.2

Component Side

Mounting Diagram

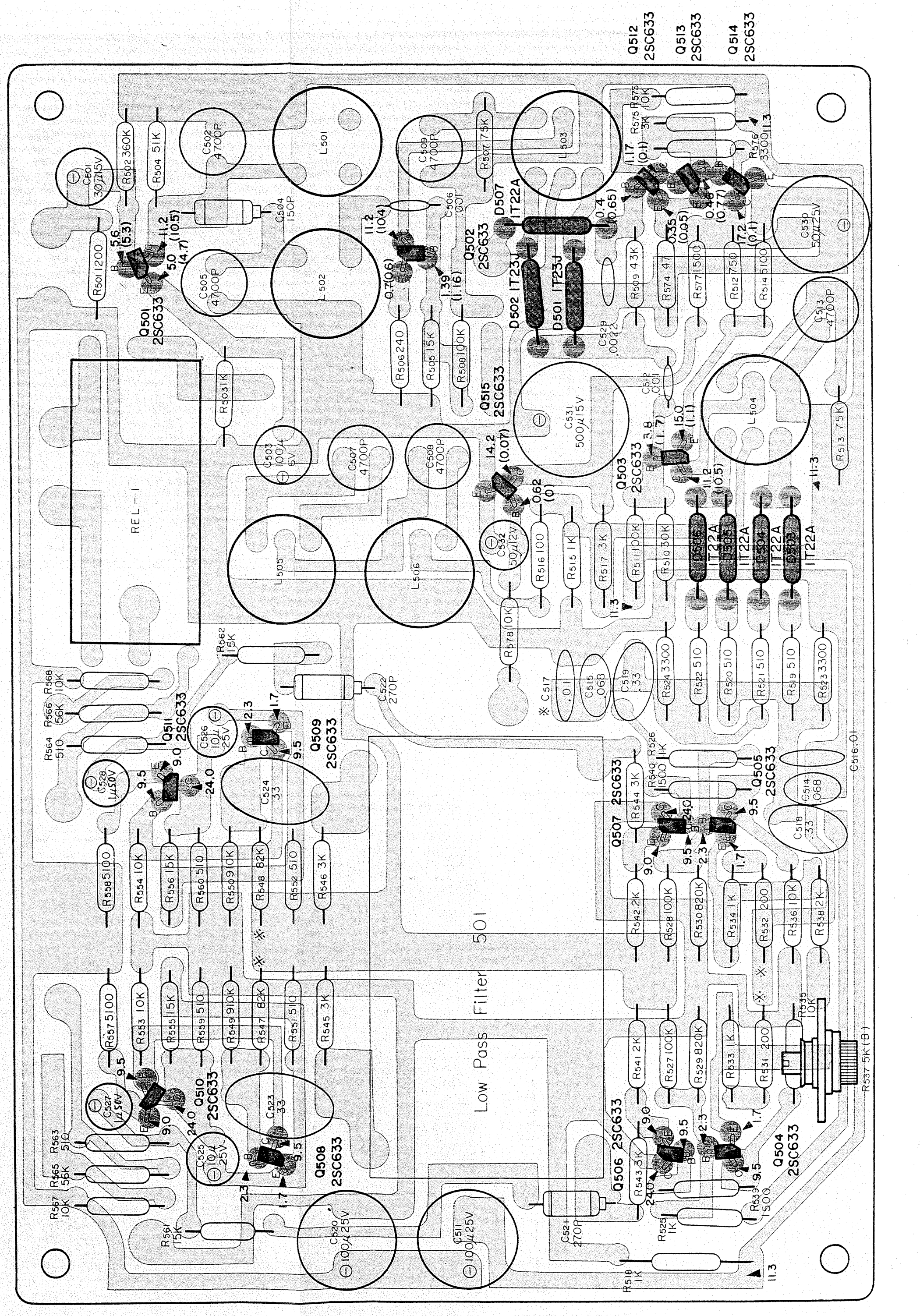
MPX Decoder Section

—Conductor Side—


To Power Supply Section R171(1K)
WHT/VLT
Q514 2SC633
Q513 2SC633
Q512 2SC633
BLU
To S4-2 (Mode) ⑧
WHT
To Muting Board R436(10K)
To Pilot Lamp
To S14 – ⓒ (FM Mode)
WHT/VLT
D507 IT22A
D501 IT23J
D502 IT23J
Q502 2SC633
Q501 2SC633
Q503 2SC633
Q515 2SC633
D503 IT22A
D504 IT22A
D505 IT22A
D506 IT22A
(High Blend)
To S15 – ⑥
To S15 – ⑨
BLK
WHT
RED
To Limiter & Detector Board Out
ORG
To Muting Board Q408 Collector
YEL
To Power Supply Section R18(680Ω)
REL-1
MPX OUT (Right CH)
To S2-1 ① (Function(2))
MPX OUT (Left CH)
To S2-1 ④ (Function(2))
Q509 2SC633
Q511 2SC633
Q505 2SC633
Q507 2SC633
Q504 2SC633
Q506 2SC633
Q508 2SC633
Q510 2SC633
Low Pass Filter 501
VLT
To Muting Board Q408 (Emitter)
To IF Board B+
To Power Supply Section R13(3.3Ω) (Flat & Power Supply Board)
To Muting Board B+
RED

MPX Decoder Section

—Component Side—

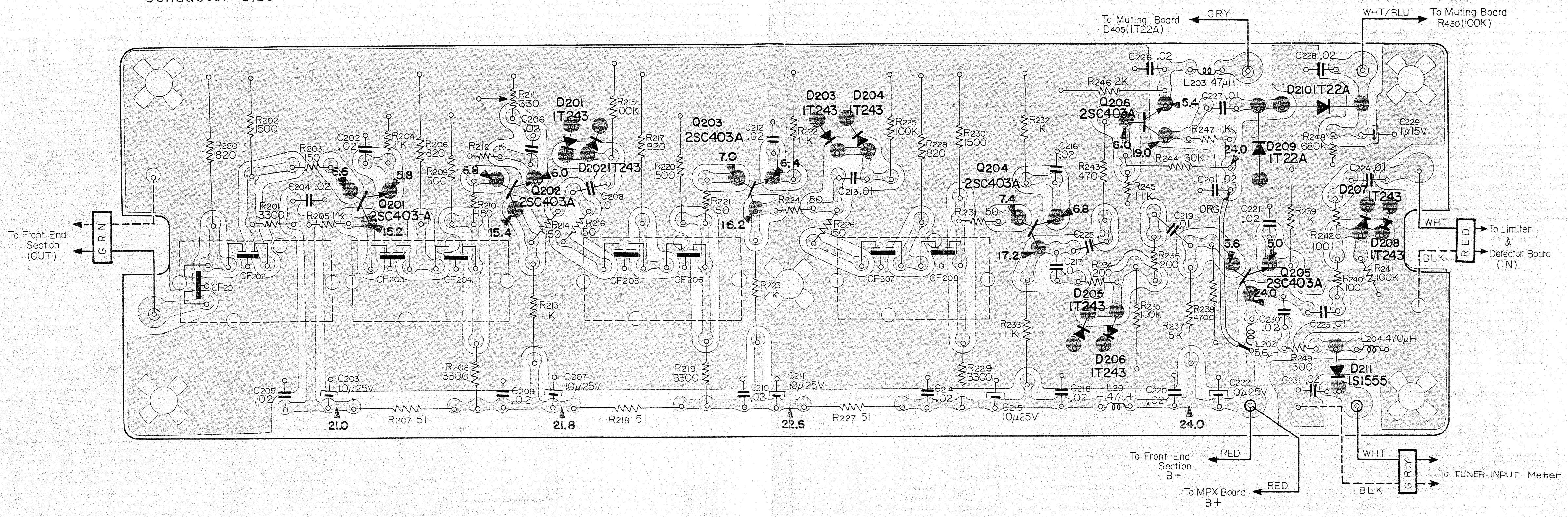

Q512 2SC633
Q513 2SC633
Q514 2SC633
L501
L502
L503
L504
L505
L506
REL-1
Q501 2SC633
Q502 2SC633
D507 IT22A
D502 IT23J
D501 IT23J
Q515 2SC633
Q503 2SC633
Q511 2SC633
Q509 2SC633
Q507 2SC633
Q505 2SC633
Q510 2SC633
Q508 2SC633
Q506 2SC633
Q504 2SC633
Low Pass Filter 501

※ To be Selected

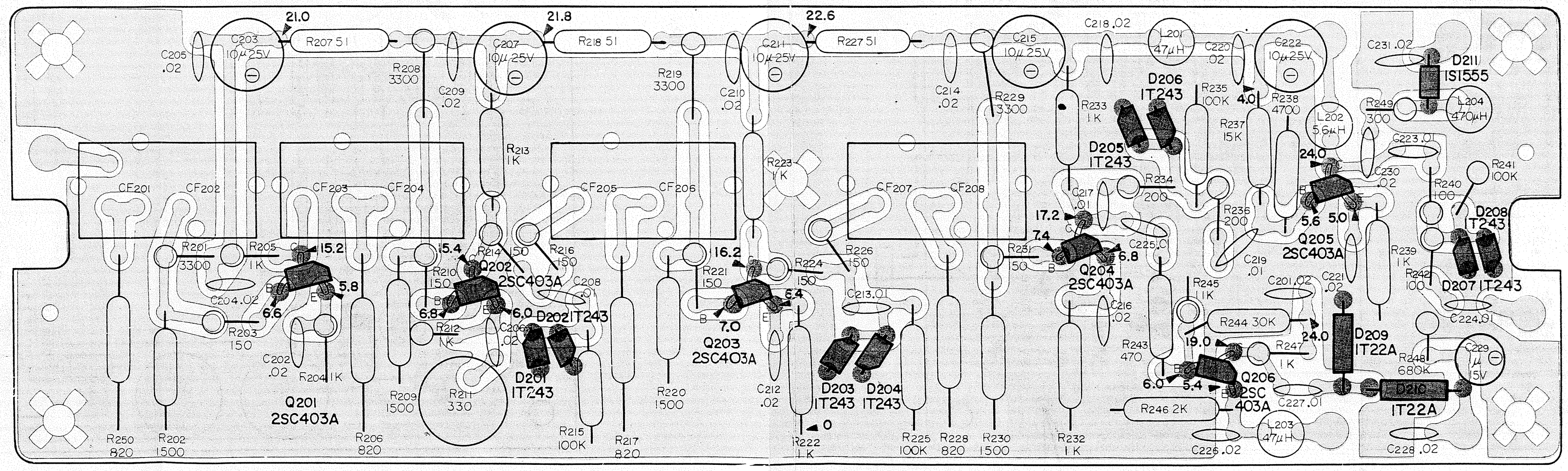
Mounting Diagram

I-F Amplifier Section

— Conductor Side —


To Muting Board D405(IT22A)
GRY
WHT/BLU
To Muting Board R430(100K)
To Front End Section (OUT)
GRN
WHT
RED
BLK
To Limiter & Detector Board (IN)
To Front End Section B+
RED
To MPX Board B+
RED
WHT
GRY
BLK
To TUNER INPUT Meter
Q201 2SC403A
Q202 2SC403A
Q203 2SC403A
Q204 2SC403A
Q205 2SC403A
Q206 2SC403A
D201 IT243
D202 IT243
D203 IT243
D204 IT243
D205 IT243
D206 IT243
D207 IT243
D208 IT243
D209 IT22A
D210 IT22A
D211 IS1555
CF201
CF202
CF203
CF204
CF205
CF206
CF207
CF208
L201 47μH
L202 5.6μH
L203 47μH
L204 470μH
21.0
21.8
22.6
24.0
R207 51
R218 51
R227 51

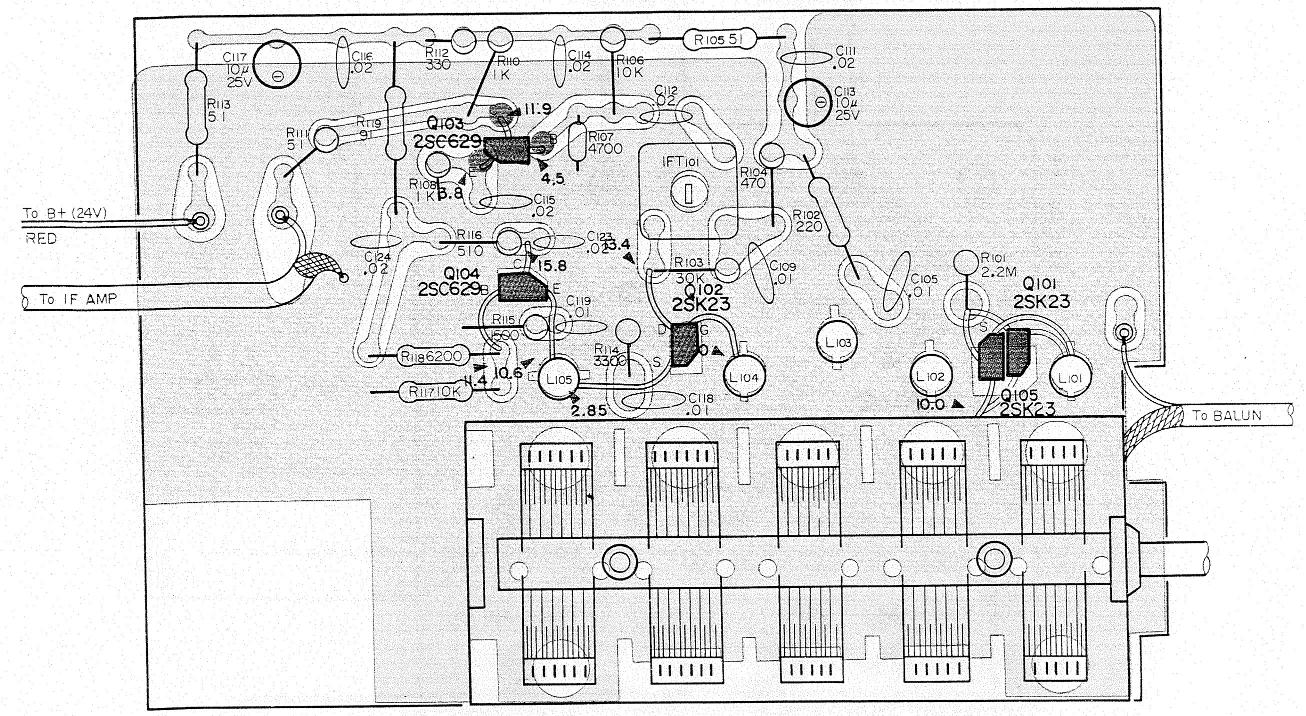
— Component Side —


21.0
21.8
22.6
R207 51
R218 51
R227 51
CF201
CF202
CF203
CF204
CF205
CF206
CF207
CF208
Q201 2SC403A
Q202 2SC403A
Q203 2SC403A
Q204 2SC403A
Q205 2SC403A
Q206 2SC403A
D201 IT243
D202 IT243
D203 IT243
D204 IT243
D205 IT243
D206 IT243
D207 IT243
D208 IT243
D209 IT22A
D210 IT22A
D211 IS1555

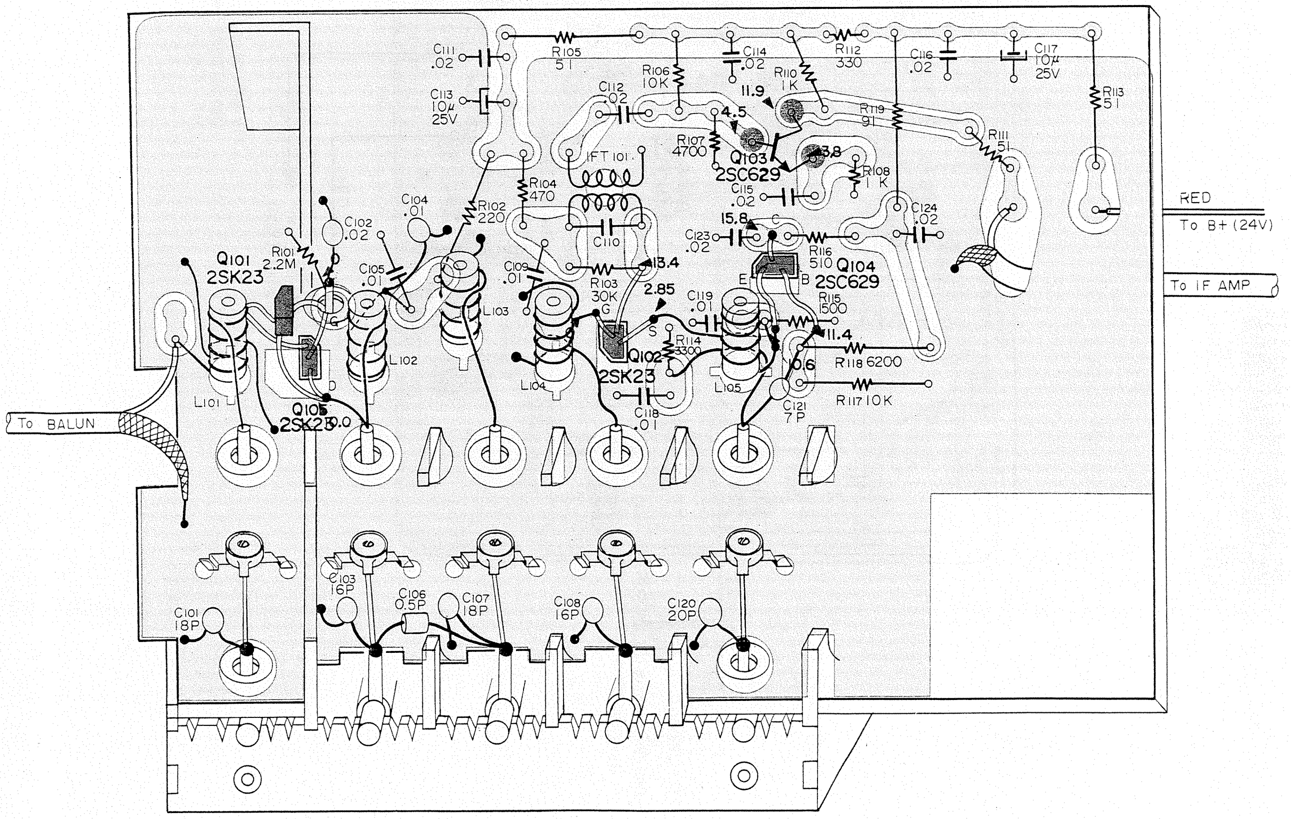
Mounting Diagram

Front End Section

— Conductor Side —


C117 10μ 25V
C116 .02
R112 330
R110 1K
C114 .02
R106 10K
R105 51
C111 .02
C113 10μ 25V
C112 .02
R113 51
R111 51
R119 91
Q103 2SC629
11.9
R107 4700
4.5
R108 1K
3.8
C115 .02
IFT101
R104 470
R102 220
To B+ (24V)
RED
To IF AMP
C124 .02
R116 510
C123 .02
13.4
15.8
Q104 2SC629
C
B
E
C119 .01
R115 1500
R103 30K
Q102 2SK23
D
G
S
C109 .01
C105 .01
R101 2.2M
Q101 2SK23
R118 6200
R117 10K
R114 3300
11.4
10.6
2.85
L105
C118 .01
L104
L103
L102
L101
10.0
Q105 2SK23
To BALUN

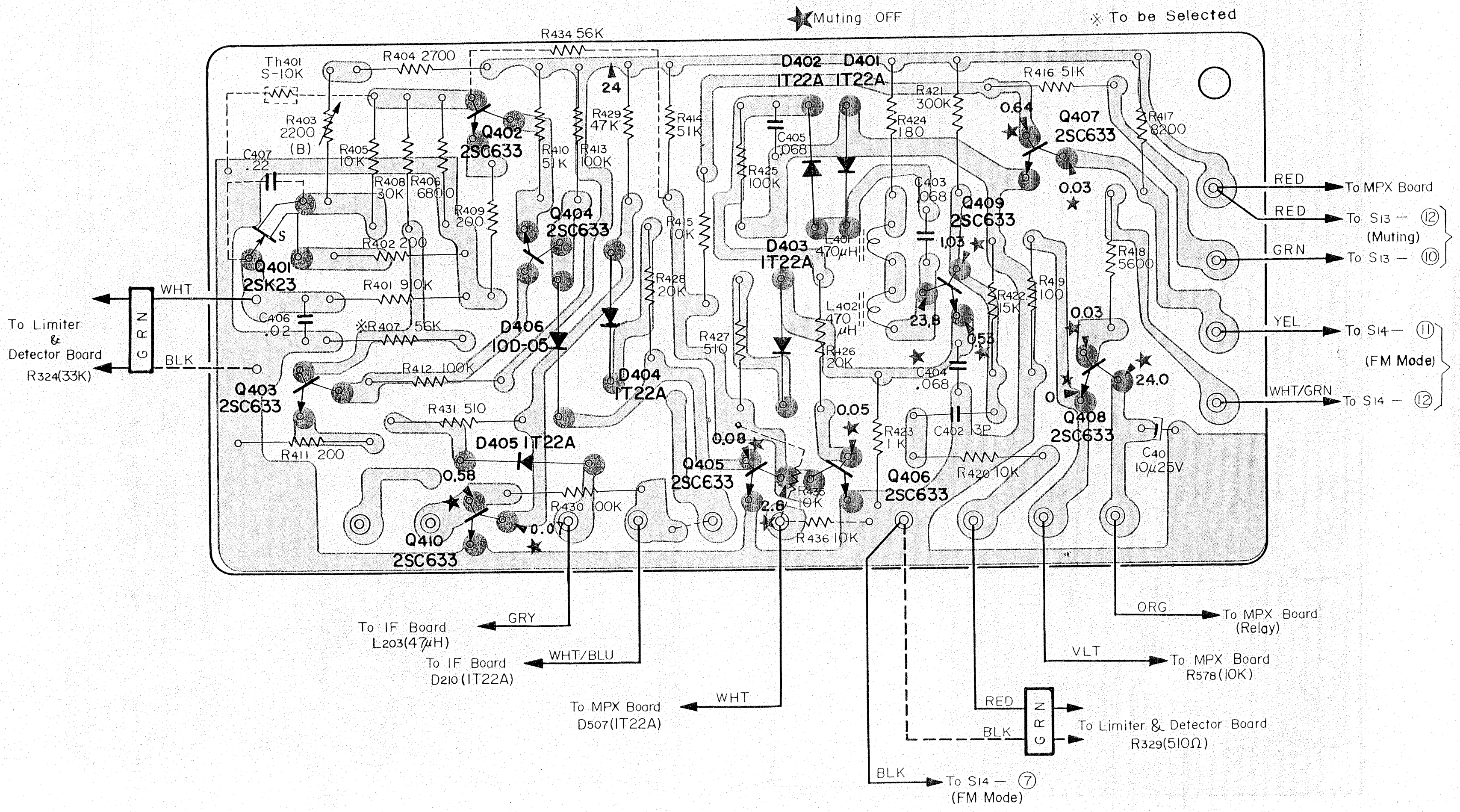
— Component Side —


C111 .02
R105 51
R106 10K
C114 .02
R112 330
C116 .02
C117 10μ 25V
R113 51
C113 10μ 25V
C112 .02
R110 1K
11.9
4.5
R119 91
R107 4700
Q103 2SC629
3.8
R111 51
R108 1K
IFT 101
C115 .02
R104 470
C104 .01
R102 220
C102 .02
C124 .02
RED
To B+ (24V)
15.8
C123 .02
C110
R116 510
Q104 2SC629
To IF AMP
Q101 2SK23
R101 2.2M
C105 .01
C109 .01
13.4
R103 30K
2.85
C119 .01
E
B
R115 1500
G
L103
S
R114 3300
11.4
L102
Q102 2SK23
R118 6200
L104
L105
10.6
R117 10K
L101
D
C118 .01
C121 7P
To BALUN
Q105 2SK23
10.0
C103 16P
C106 0.5P
C107 18P
C108 16P
C120 20P
C101 18P

Mounting Diagram

Muting Circuit Section

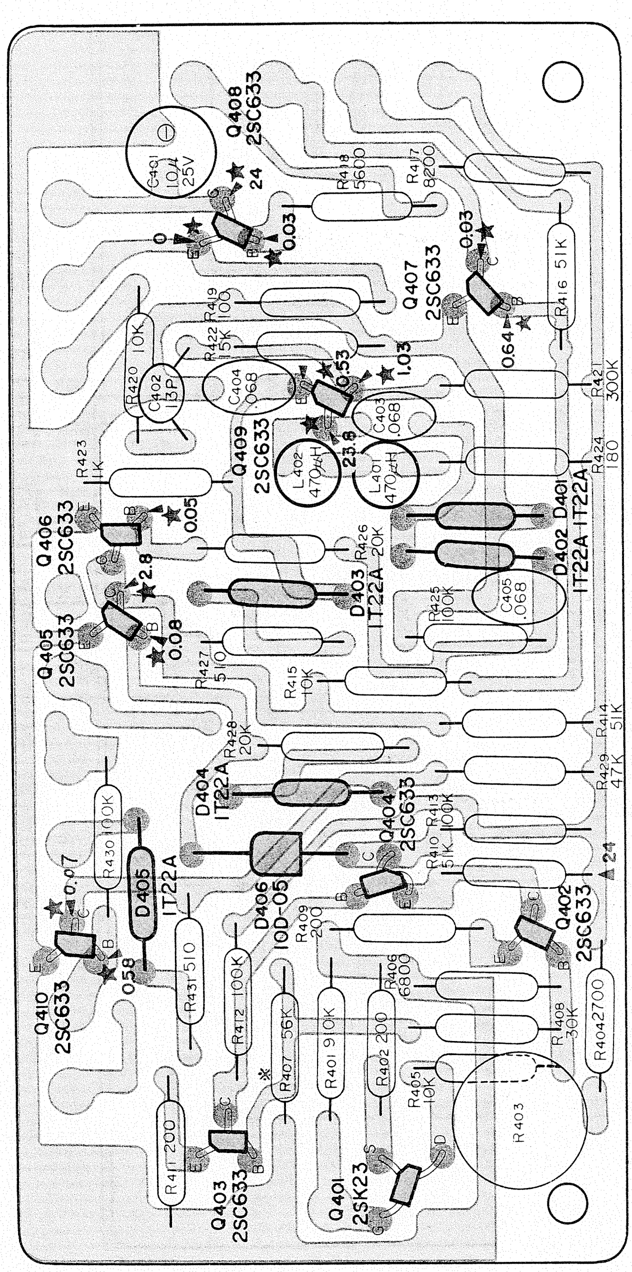
— Conductor Side —


★Muting OFF
※ To be Selected
R434 56K
Th401 S-10K
R404 2700
24
D402 IT22A
D401 IT22A
R416 51K
R421 300K
R424 180
0.64
Q407 2SC633
R417 8200
R403 2200 (B)
R405 10K
R408 30K
R406 6800
R409 200
Q402 2SC633
R429 47K
R410 51K
R413 100K
R414 51K
C405 .068
R425 100K
C403 .068
Q409 2SC633
0.03
C407 .22
R402 200
R401 9.0K
Q401 2SK23
S
Q404 2SC633
R415 10K
R428 20K
D403 IT22A
L401 470μH
L402 470 μH
1.03
R422 15K
R419 100
R418 5600
0.03
C406 .02
※R407 56K
R412 100K
D406 10D-05
D404 IT22A
R427 510
R426 20K
23.8
0.53
C404 .068
24.0
0
Q408 2SC633
Q403 2SC633
R431 510
R411 200
D405 IT22A
0.58
Q410 2SC633
0.07
R430 100K
0.08
Q405 2SC633
2.8
R435 10K
R436 10K
0.05
R423 1K
C402 13P
Q406 2SC633
R420 10K
C40 10μ25V
RED
To MPX Board
B+
RED
To S13 — ⑫
(Muting)
GRN
To S13 — ⑩
YEL
To S14 — ⑪
(FM Mode)
WHT/GRN
To S14 — ⑫
WHT
BLK
G R N
To Limiter & Detector Board R324(33K)
GRY
To IF Board L203(47μH)
WHT/BLU
To IF Board D210(IT22A)
WHT
To MPX Board D507(IT22A)
ORG
To MPX Board (Relay)
VLT
To MPX Board R578(10K)
RED
BLK
G R N
To Limiter & Detector Board R329(510Ω)
BLK
To S14 — ⑦
(FM Mode)

Muting Circuit Diagram

Muting Circuit Section

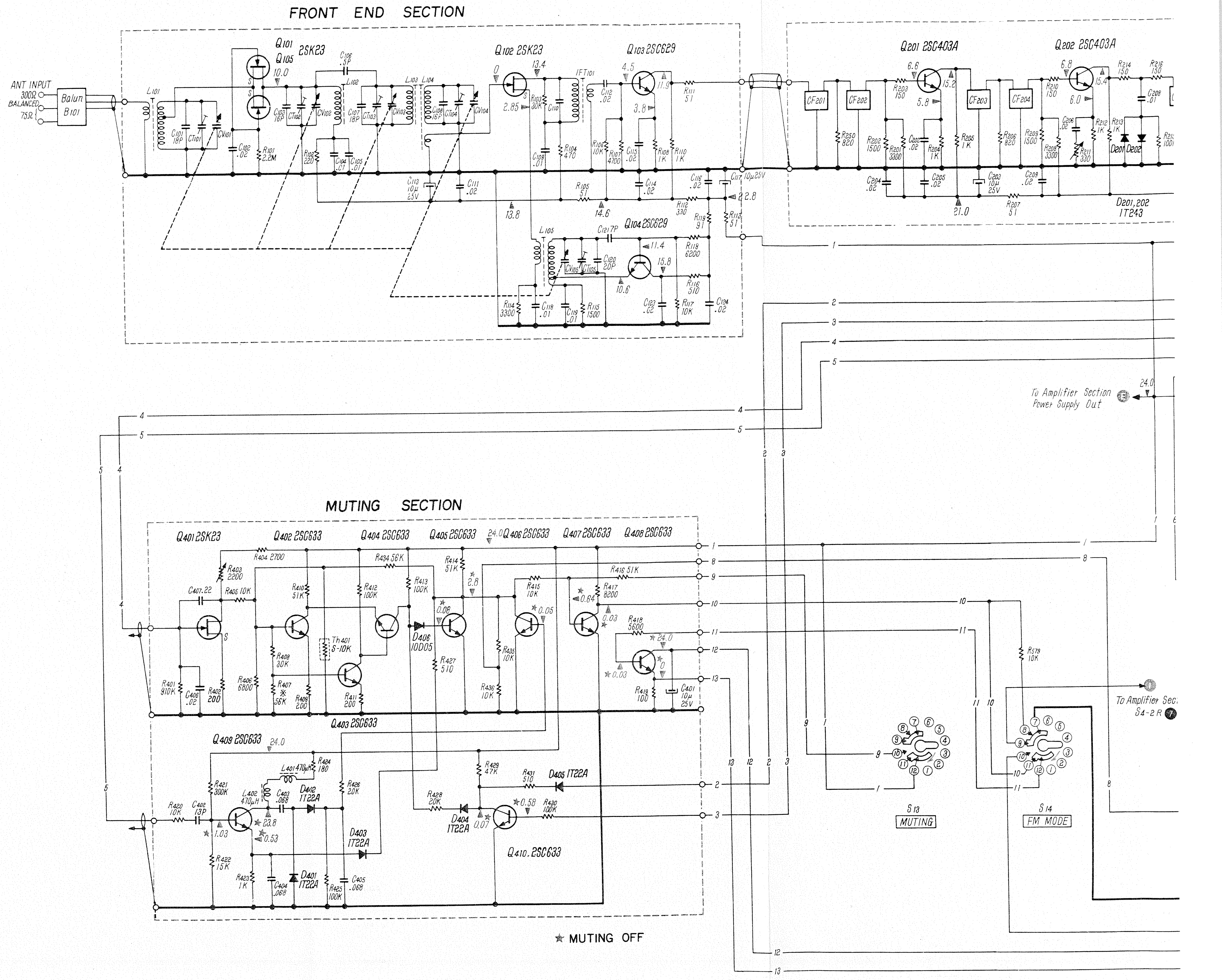
— Component Side —


Q408
2SC633
Q407
2SC633
Q409
2SC633
Q406
2SC633
Q405
2SC633
Q404
2SC633
Q402
2SC633
Q410
2SC633
Q403
2SC633
Q401
2SK23
C401
10μ
25V
C402
15P
C403
.068
C404
.068
C405
.068
L401
470μH
L402
470μH
D401
IT22A
D402
IT22A
D403
IT22A
D404
IT22A
D405
IT22A
D406
10D-05
R403
R418 5600
R417 8200
R416 51K
R421 300K
R424 180
R420 10K
R422 15K
R423 1K
R426 20K
R425 100K
R427 510
R415 10K
R414 51K
R428 20K
R429 47K
R430 100K
R431 510
R412 100K
R407 56K
R401 910K
R402 200
R405 10K
R406 6800
R408 30K
R409 200
R404 2700
R410 51K
R413 100K
R411 200
R419 100
24
0.03
0.64
0.53
1.03
23.8
0.05
2.8
0.08
0.07
0.58

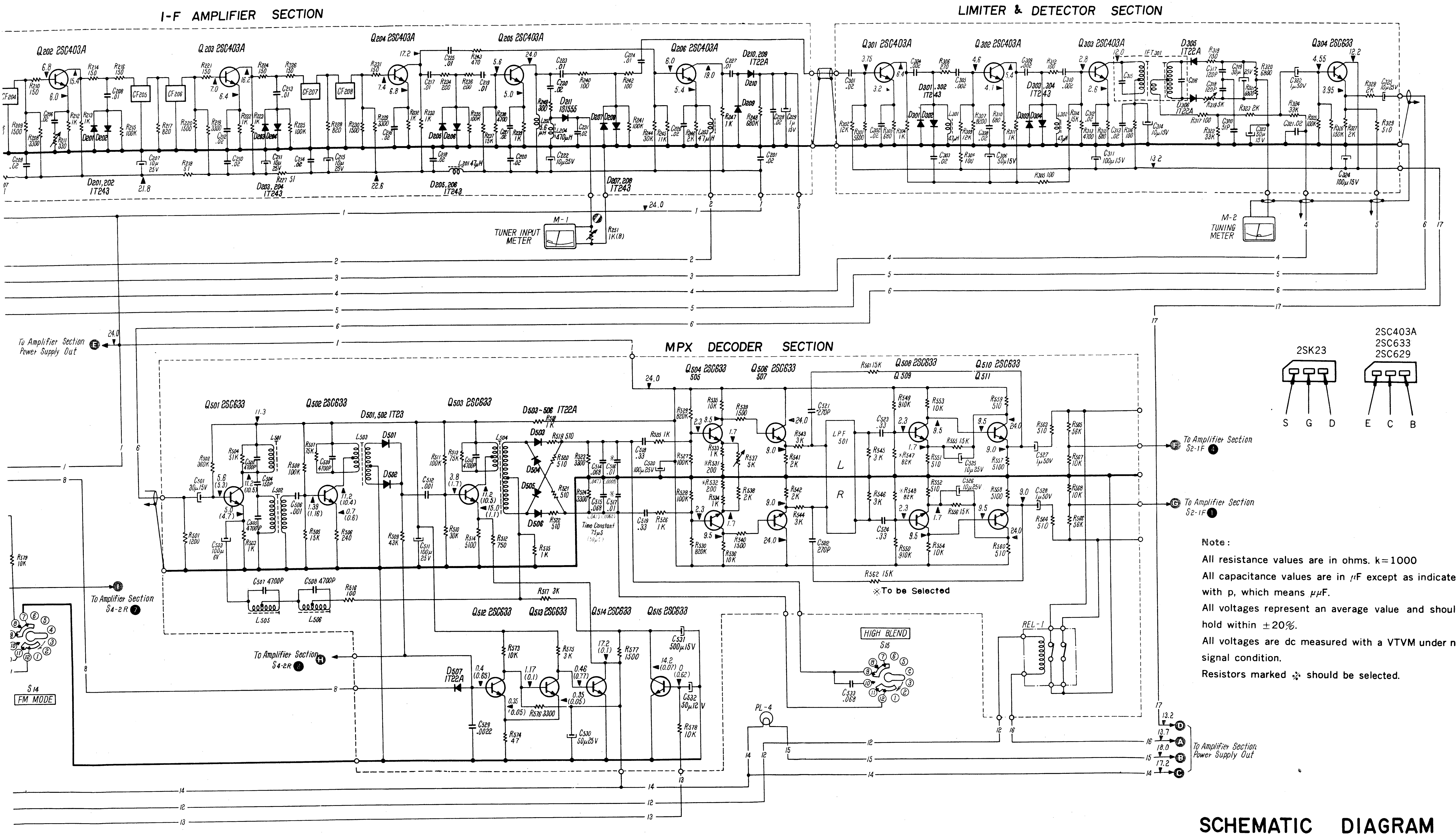
※ To be Selected

★ Muting OFF

Schematic Diagram


FRONT END SECTION
ANT INPUT
300Ω BALANCED
75Ω
Balun B101
Q101 Q105 2SK23
Q102 2SK23
Q103 2SC629
Q104 2SC629
Q201 2SC403A
Q202 2SC403A
IFT101
CF201
CF202
CF203
CF204
D201,202 IT243
To Amplifier Section Power Supply Out
24.0
MUTING SECTION
Q401 2SK23
Q402 2SC633
Q404 2SC633
Q405 2SC633
Q406 2SC633
Q407 2SC633
Q408 2SC633
Q403 2SC633
Q409 2SC633
Q410 2SC633
Th401 S-10K
D406 10D05
D405 IT22A
D404 IT22A
D403 IT22A
D401 IT22A
D402 IT22A
L401 470μH
L402 470μH
S13 MUTING
S14 FM MODE
To Amplifier Section S4-2R

★ MUTING OFF


I-F AMPLIFIER SECTION
LIMITER & DETECTOR SECTION
MPX DECODER SECTION
Q202 2SC403A
Q203 2SC403A
Q204 2SC403A
Q205 2SC403A
Q206 2SC403A
Q301 2SC403A
Q302 2SC403A
Q303 2SC403A
Q304 2SC633
D201, 202 IT243
D203, 204 IT243
D205, 206 IT243
D207, 208 IT243
D210, 209 IT22A
D211 1S1555
D301, 302 IT243
D303, 304 IT243
D305 IT22A
D306 IT22A
IFT301
CF204
CF205
CF206
CF207
CF208
M-1
TUNER INPUT METER
R251 1K(B)
M-2
TUNING METER
To Amplifier Section Power Supply Out E
Q501 2SC633
Q502 2SC633
Q503 2SC633
Q504 2SC633 505
Q506 2SC633 507
Q508 2SC633 Q509
Q510 2SC633 Q511
D501, 502 IT23
D503~506 IT22A
D507 IT22A
LPF 501
L
R
Time Constant 75μS
To Amplifier Section S2-1F 4
To Amplifier Section S2-1F 1
To Amplifier Section S4-2R 7
To Amplifier Section S4-2R 8 H
Q512 2SC633
Q513 2SC633
Q514 2SC633
Q515 2SC633
HIGH BLEND
S15
REL-1
PL-4
S14
FM MODE
To Amplifier Section Power Supply Out
D
A
B
C
✻To be Selected
2SK23
S G D
2SC403A
2SC633
2SC629
E C B

( )STEREO OPERATION

Note:

All resistance values are in ohms. k=1000

All capacitance values are in μF except as indicated with p, which means μμF.

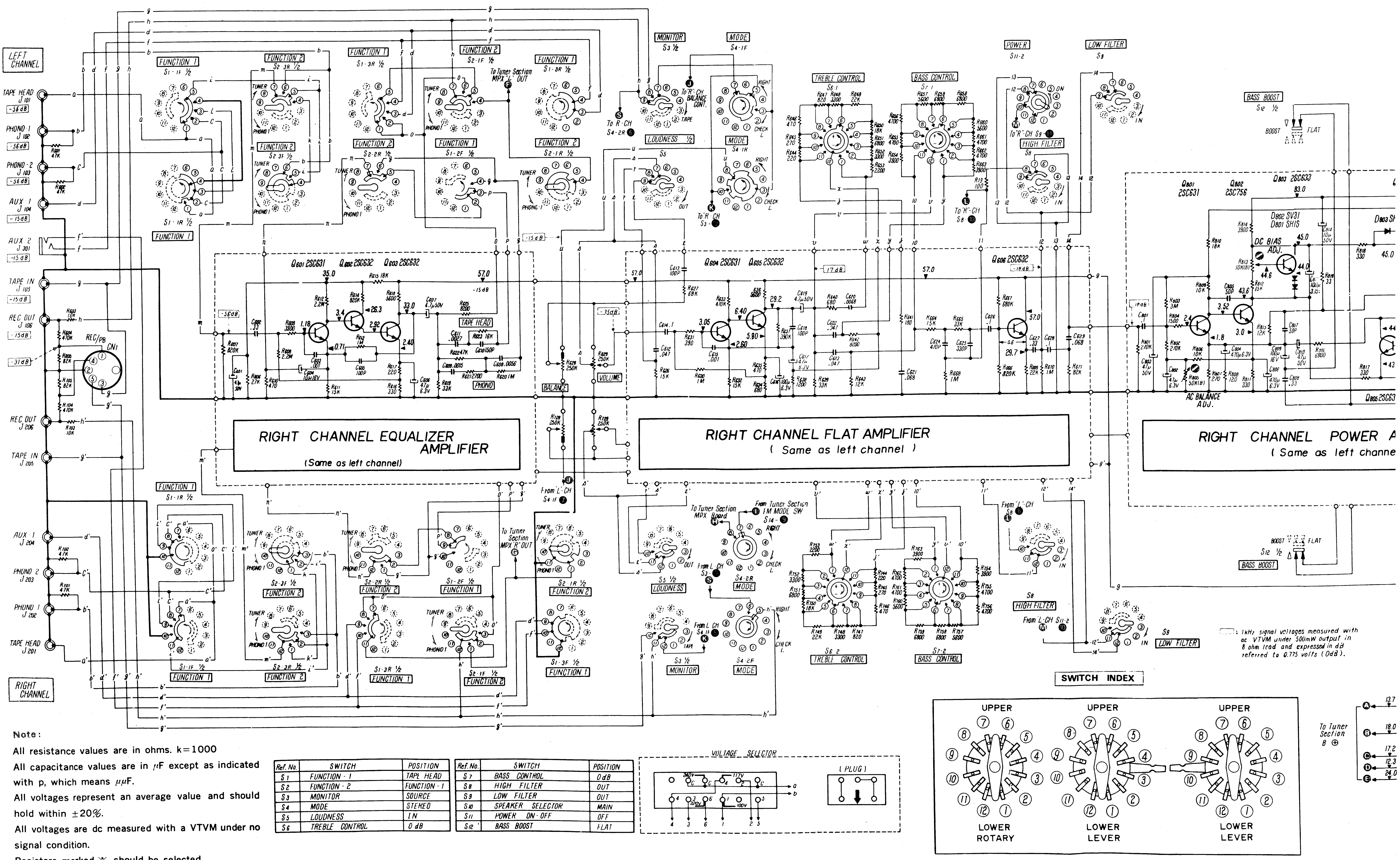
All voltages represent an average value and should hold within ±20%.

All voltages are dc measured with a VTVM under no signal condition.

Resistors marked ✻ should be selected.

SCHEMATIC DIAGRAM

TUNER & MPX SECTION


LEFT CHANNEL
TAPE HEAD J101 -56dB
PHONO 1 J102 -56dB
PHONO 2 J103 -56dB
AUX 1 J104 -15dB
AUX 2 J301 -15dB
TAPE IN J105 -15dB
REC OUT J106 -15dB
REC/PB
CN1
REC OUT J206
TAPE IN J205
AUX 1 J204
PHONO 2 J203
PHONO 1 J202
TAPE HEAD J201
RIGHT CHANNEL
FUNCTION 1
FUNCTION 2
MONITOR S3 ½
MODE S4-1F
To Tuner Section MPX 'L' OUT
To 'R'-CH BALANCE CONT.
LOUDNESS ½ S5
TREBLE CONTROL S6-1
BASS CONTROL S7-1
POWER S11-2
LOW FILTER S9
HIGH FILTER S8
BASS BOOST S12 ½
BOOST
FLAT
Q601 2SC631
Q602 2SC632
Q603 2SC632
Q604 2SC631
Q605 2SC632
Q606 2SC632
Q801 2SC631
Q802 2SC756
Q803 2SC633
D802 SV31
D801 SH1S
DC BIAS ADJ.
AC BALANCE ADJ.
TAPE HEAD
PHONO
BALANCE
VOLUME
RIGHT CHANNEL EQUALIZER AMPLIFIER
(Same as left channel)
RIGHT CHANNEL FLAT AMPLIFIER
(Same as left channel)
RIGHT CHANNEL POWER A
(Same as left channe
To Tuner Section MPX Board
From Tuner Section FM MODE SW
To Tuner Section MPX 'R' OUT
SWITCH INDEX
UPPER
LOWER
ROTARY
LEVER
VOLTAGE SELECTOR
240V
117V
220V
100V
(PLUG)
To Tuner Section B ⊕

▭ : 1kHz signal voltages measured with ac VTVM under 500mW output in 8 ohm load and expressed in dB referred to 0.775 volts (0dB).

Note:

All resistance values are in ohms. k=1000

All capacitance values are in μF except as indicated with p, which means μμF.

All voltages represent an average value and should hold within ±20%.

All voltages are dc measured with a VTVM under no signal condition.

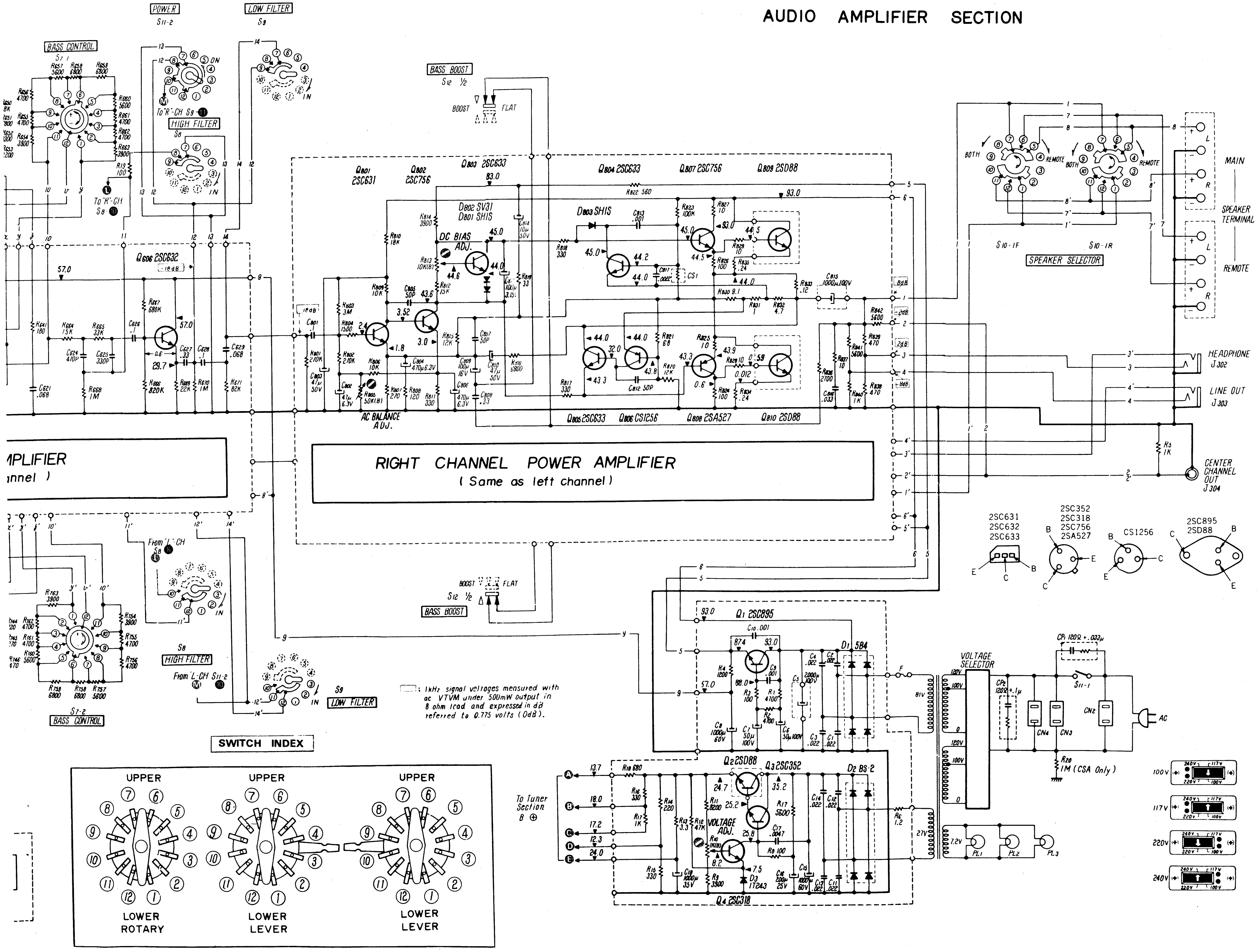
Resistors marked ※ should be selected.

Ref. No.	SWITCH	POSITION
S 1	FUNCTION - 1	TAPE HEAD
S 2	FUNCTION - 2	FUNCTION - 1
S 3	MONITOR	SOURCE
S 4	MODE	STEREO
S 5	LOUDNESS	IN
S 6	TREBLE CONTROL	0 dB

Ref. No.	SWITCH	POSITION
S 7	BASS CONTROL	0 dB
S 8	HIGH FILTER	OUT
S 9	LOW FILTER	OUT
S 10	SPEAKER SELECTOR	MAIN
S 11	POWER ON - OFF	OFF
S 12	BASS BOOST	FLAT

SCHEMATIC DIAGRAM

AUDIO AMPLIFIER SECTION

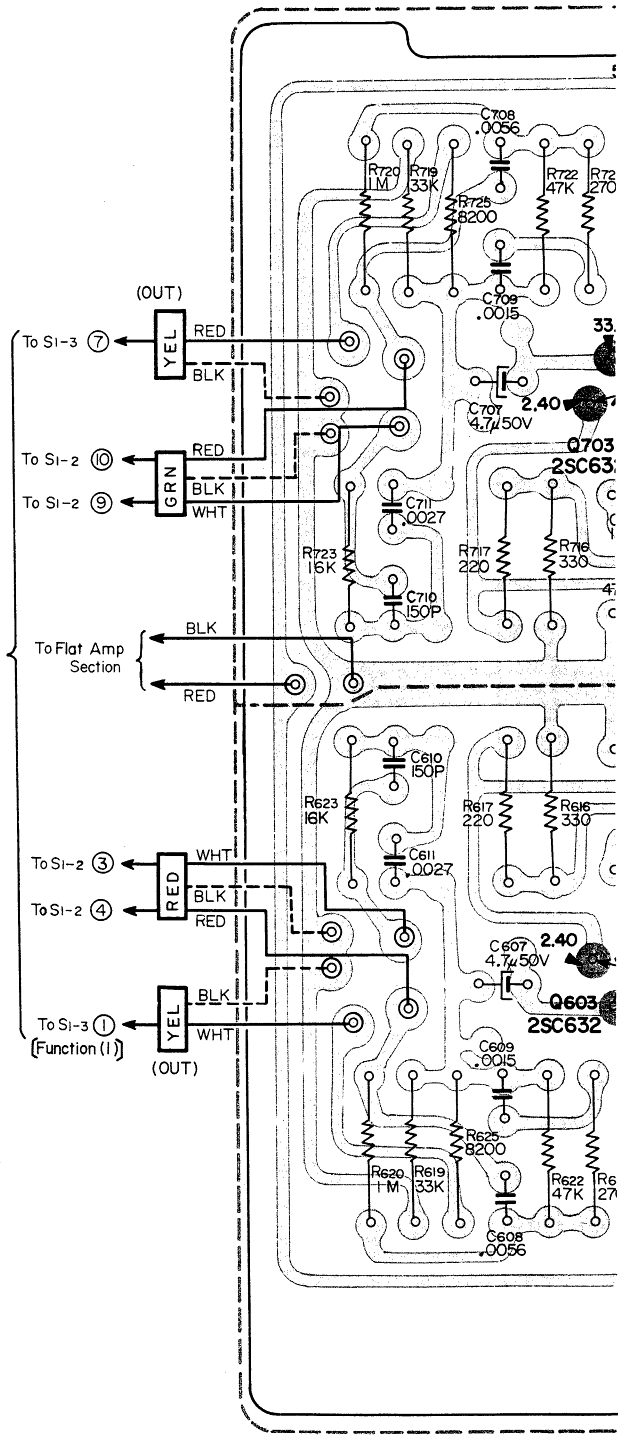

POWER S11-2
LOW FILTER S9
BASS CONTROL S7-1
HIGH FILTER S8
To 'R'-CH S9
To 'R'-CH S8
BASS BOOST S12 ½
BOOST
FLAT
Q801 2SC631
Q802 2SC756
Q803 2SC633
Q804 2SC633
Q807 2SC756
Q809 2SD88
D802 SV31
D801 SH1S
D803 SH1S
DC BIAS ADJ.
AC BALANCE ADJ.
Q805 2SC633
Q806 CS1256
Q808 2SA527
Q810 2SD88
Q606 2SC632
RIGHT CHANNEL POWER AMPLIFIER
(Same as left channel)
MPLIFIER
nnel)
BOTH
REMOTE
S10-1F
S10-1R
SPEAKER SELECTOR
MAIN
SPEAKER TERMINAL
REMOTE
HEADPHONE J302
LINE OUT J303
CENTER CHANNEL OUT J304
2SC631
2SC632
2SC633
2SC352
2SC318
2SC756
2SA527
CS1256
2SC895
2SD88
E
B
C
From 'L'-CH S8
From 'L'-CH S11-2
S7-2 BASS CONTROL
S9 LOW FILTER
IN
Q1 2SC895
D1 5B4
Q2 2SD88
Q3 2SC352
D2 BS-2
VOLTAGE ADJ.
D3 1T243
Q4 2SC318
VOLTAGE SELECTOR
CP1 120Ω + .033μ
S11-1
CN2
CN3
CN4
AC
R20 1M (CSA Only)
To Tuner Section B ⊕
PL1
PL2
PL3
81V
27V
7.2V
100V
117V
220V
240V
SWITCH INDEX
UPPER
LOWER ROTARY
LOWER LEVER

▭ : 1kHz signal voltages measured with ac VTVM under 500mW output in 8 ohm load and expressed in dB referred to 0.775 volts (0dB).

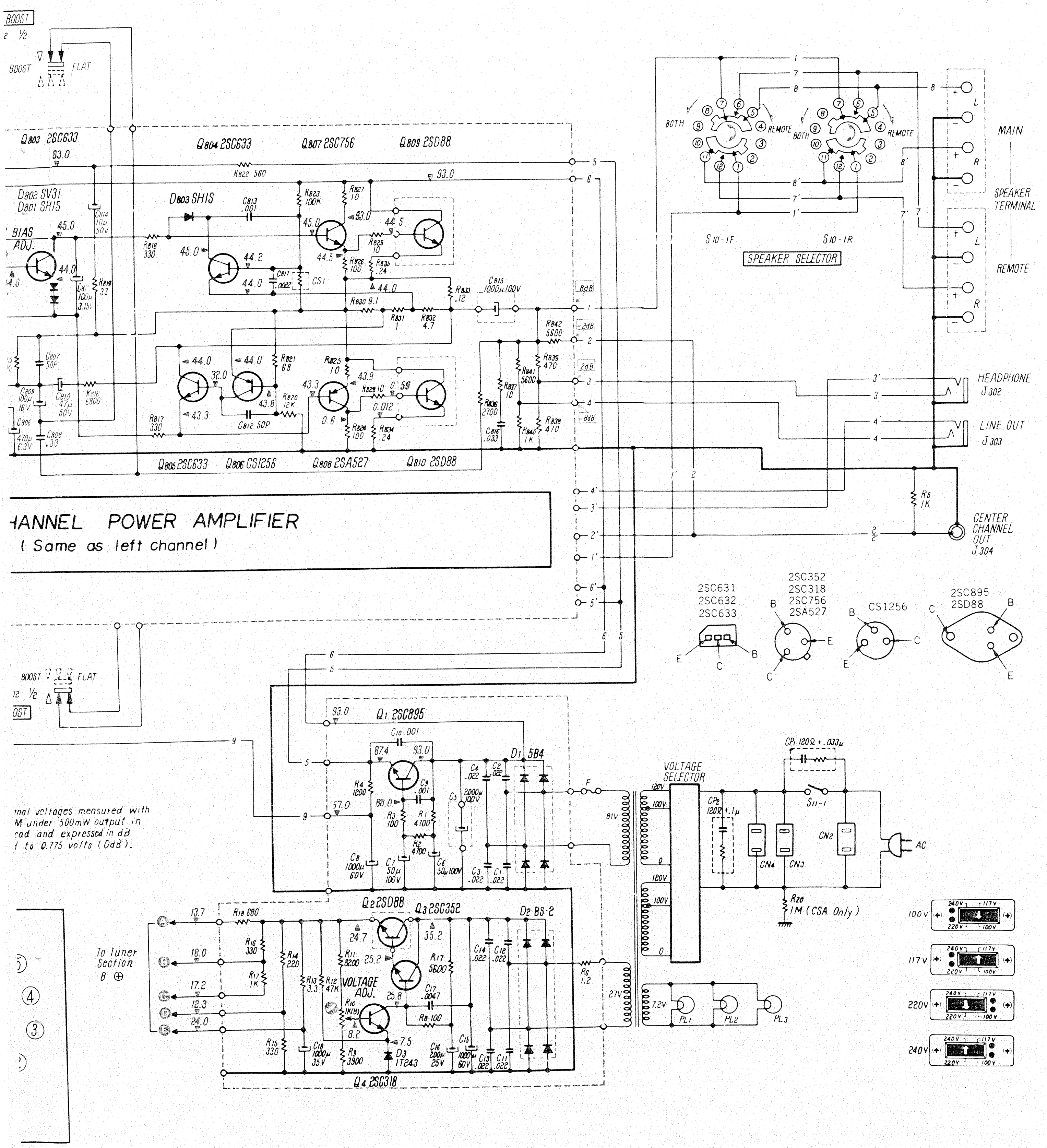
Mounting

Equalizer Am

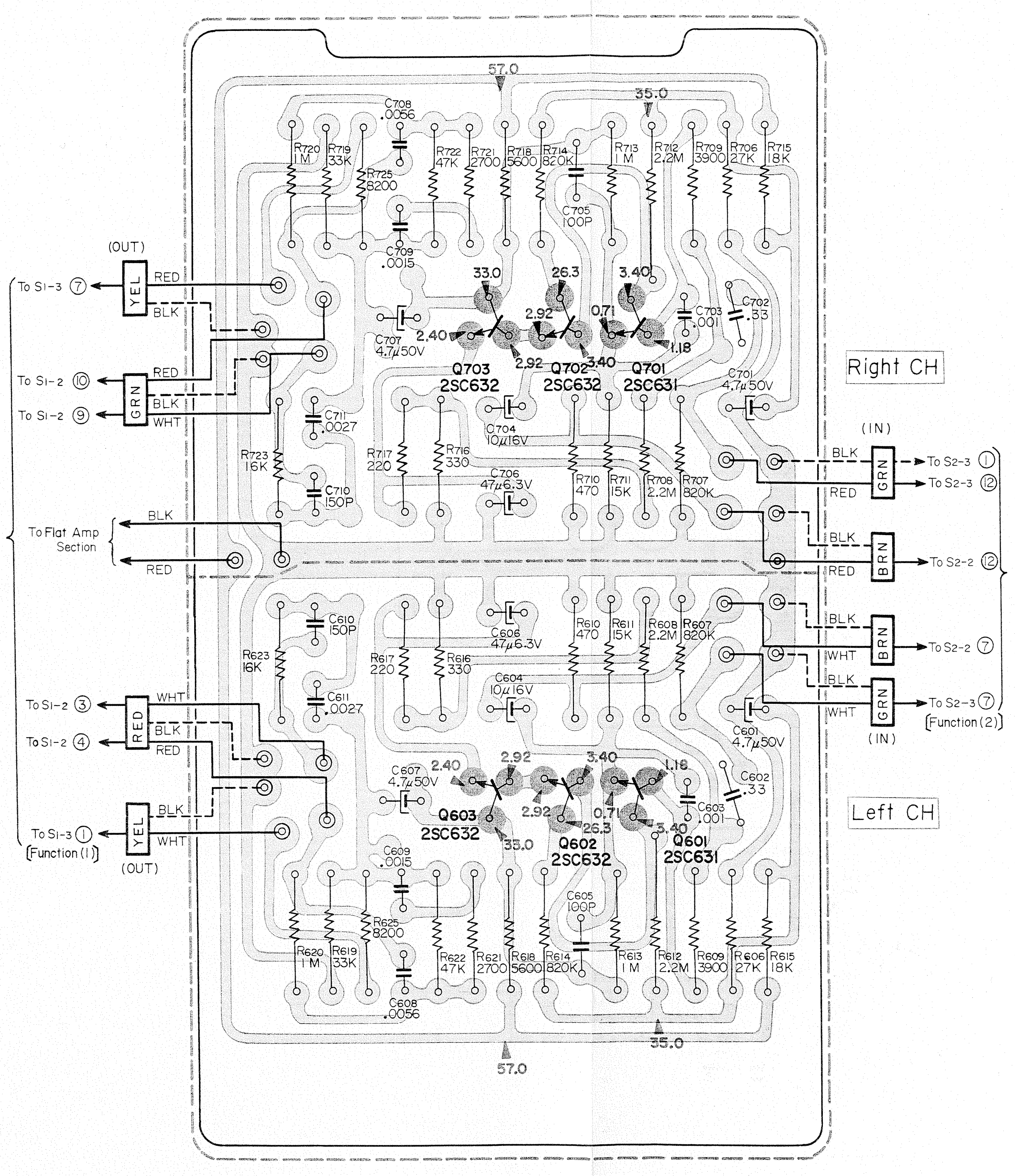
— Conducto


(OUT)
To S1-3 ⑦
To S1-2 ⑩
To S1-2 ⑨
YEL
GRN
RED
BLK
WHT
To Flat Amp Section
To S1-2 ③
To S1-2 ④
To S1-3 ①
(Function (I))
C708 .0056
R720 1M
R719 33K
R725 8200
R722 47K
C709 .0015
C707 4.7μ50V
2.40
Q703 2SC63
C711 .0027
R723 16K
R717 220
R716 330
C710 150P
C610 150P
R623 16K
R617 220
R616 330
C611 .0027
C607 4.7μ50V
Q603 2SC632
C609 .0015
R625 8200
R620 1M
R619 33K
R622 47K
C608 .0056

SCHEMATIC DIAGRAM
AUDIO AMPLIFIER SECTION

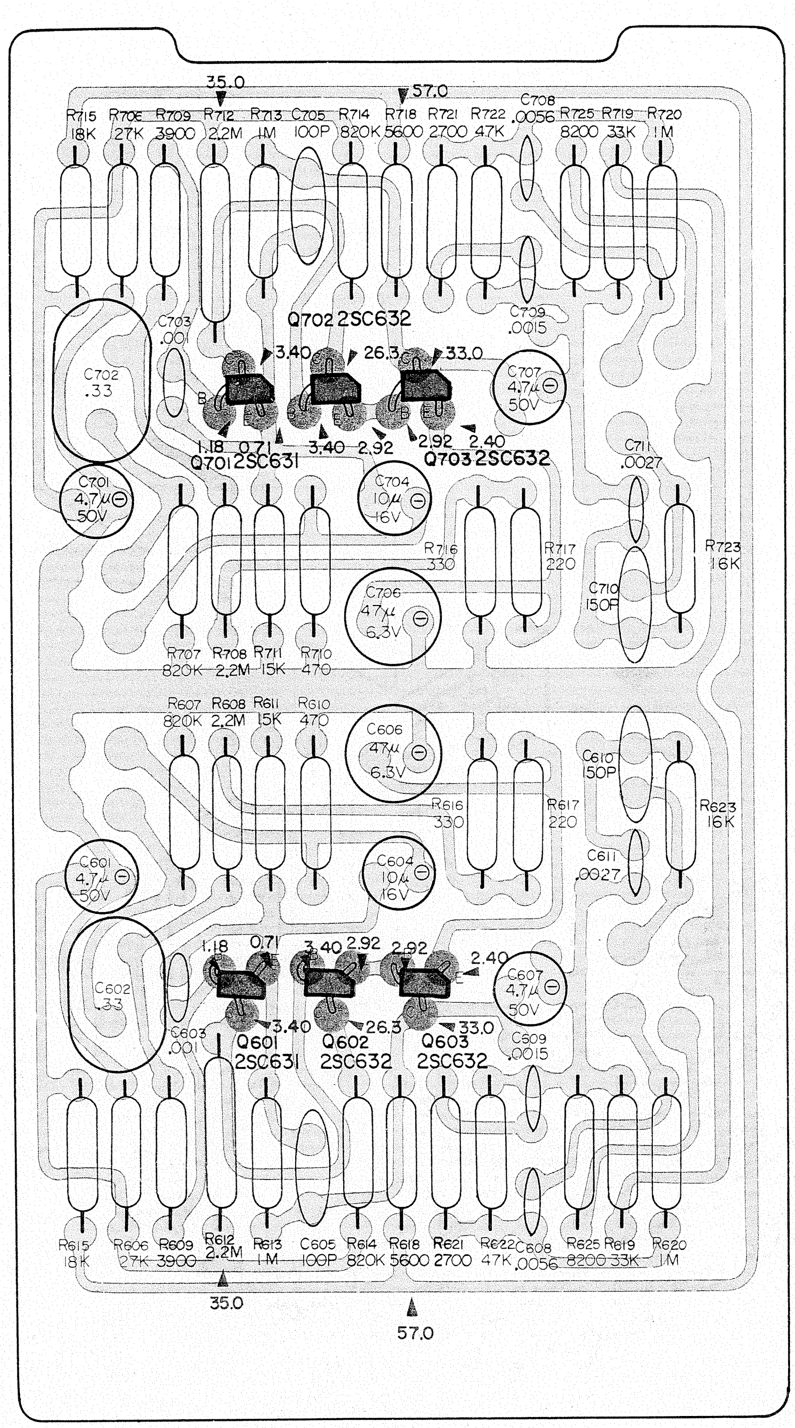

BOOST
FLAT
Q803 2SC633
Q804 2SC633
Q807 2SC756
Q809 2SD88
D802 SV31
D801 SHIS
D803 SHIS
BIAS ADJ.
Q805 2SC633
Q806 CS1256
Q808 2SA527
Q810 2SD88
BOTH
REMOTE
S10-1F
S10-1R
SPEAKER SELECTOR
MAIN
SPEAKER TERMINAL
REMOTE
HEADPHONE J302
LINE OUT J303
CENTER CHANNEL OUT J304
HANNEL POWER AMPLIFIER
(Same as left channel)
2SC631
2SC632
2SC633
2SC352
2SC318
2SC756
2SA527
CS1256
2SC895
2SD88
Q1 2SC895
D1 5B4
VOLTAGE SELECTOR
AC
CN4
CN3
CN2
S11-1
R20 1M (CSA Only)
100V
117V
220V
240V
Q2 2SD88
Q3 2SC352
D2 BS-2
VOLTAGE ADJ.
Q4 2SC318
D3 1T243
PL1
PL2
PL3
To Tuner Section B ⊕
nal voltages measured with M under 500mW output in rad and expressed in dB to 0.775 volts (0dB).

Mounting Diagram
Equalizer Amplifier Section
— Conductor Side —


57.0
35.0
(OUT)
To S1-3 ⑦
YEL
RED
BLK
To S1-2 ⑩
To S1-2 ⑨
GRN
WHT
Q703 2SC632
Q702 2SC632
Q701 2SC631
Right CH
(IN)
To S2-3 ①
To S2-3 ⑫
To S2-2 ⑫
BRN
To Flat Amp Section
To S2-2 ⑦
To S2-3 ⑦
(Function (2))
Left CH
To S1-2 ③
To S1-2 ④
To S1-3 ①
(Function (1))
Q603 2SC632
Q602 2SC632
Q601 2SC631

Equalizer Amplifier Section

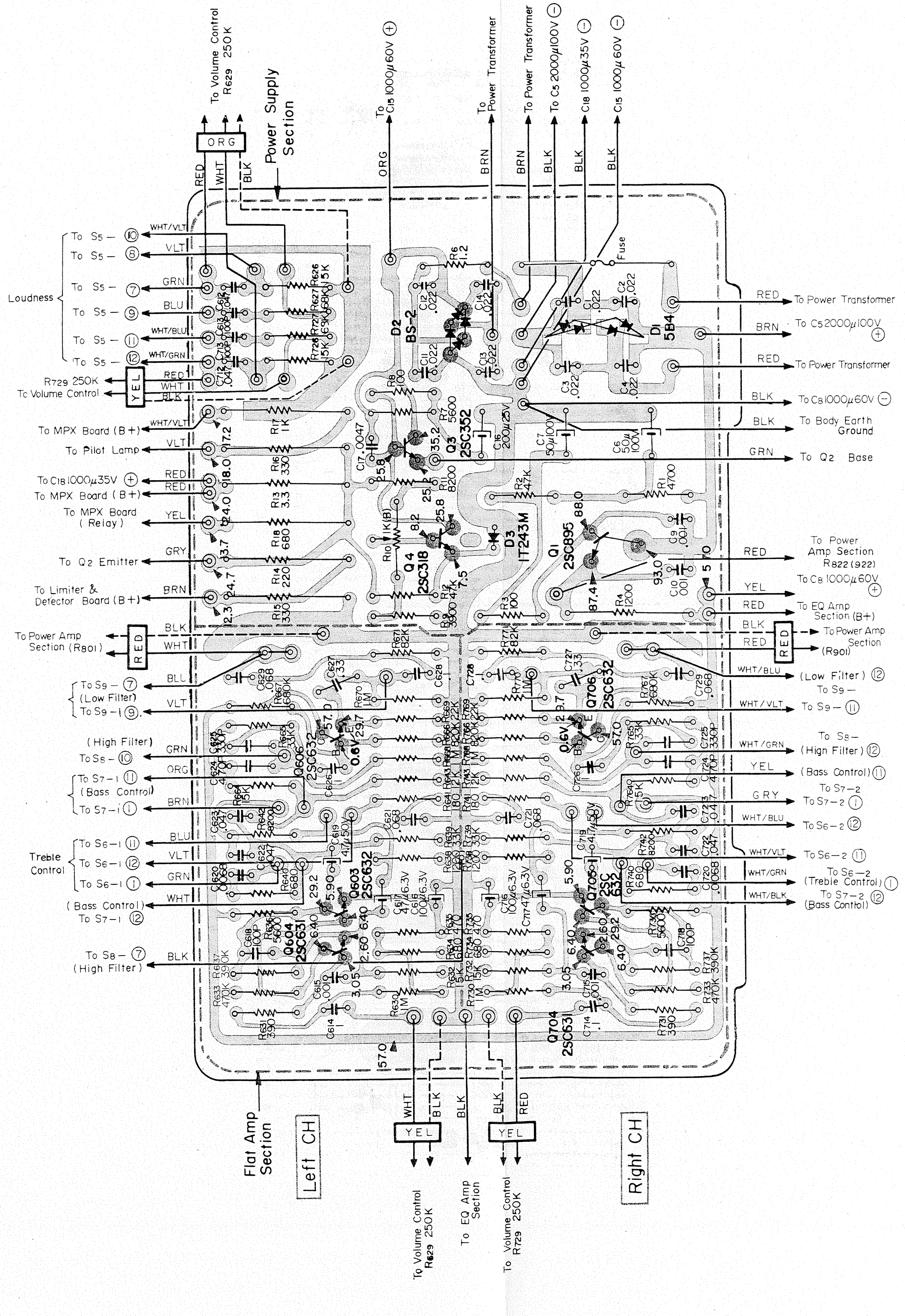
— Component Side —


35.0
57.0
R715 18K
R706 27K
R709 3900
R712 2.2M
R713 1M
C705 100P
R714 820K
R718 5600
R721 2700
R722 47K
C708 .0056
R725 8200
R719 33K
R720 1M
C703 .001
C702 .33
Q702 2SC632
C709 .0015
3.40
26.3
33.0
C707 4.7μ 50V
1.18
0.71
3.40
2.92
2.92
2.40
Q701 2SC631
Q703 2SC632
C711 .0027
C701 4.7μ 50V
C704 10μ 16V
R716 330
R717 220
R723 16K
C706 47μ 6.3V
C710 150P
R707 820K
R708 2.2M
R711 15K
R710 470
R607 820K
R608 2.2M
R611 15K
R610 470
C606 47μ 6.3V
C610 150P
R616 330
R617 220
R623 16K
C601 4.7μ 50V
C604 10μ 16V
C611 .0027
C602 .33
1.18
0.71
3.40
2.92
2.92
2.40
C607 4.7μ 50V
3.40
26.3
33.0
Q601 2SC631
Q602 2SC632
Q603 2SC632
C603 .001
C609 .0015
R615 18K
R606 27K
R609 3900
R612 2.2M
R613 1M
C605 100P
R614 820K
R618 5600
R621 2700
R622 47K
C608 .0056
R625 8200
R619 33K
R620 1M
35.0
57.0

Mounting Diagram

Flat Amplifier & Power Supply Section

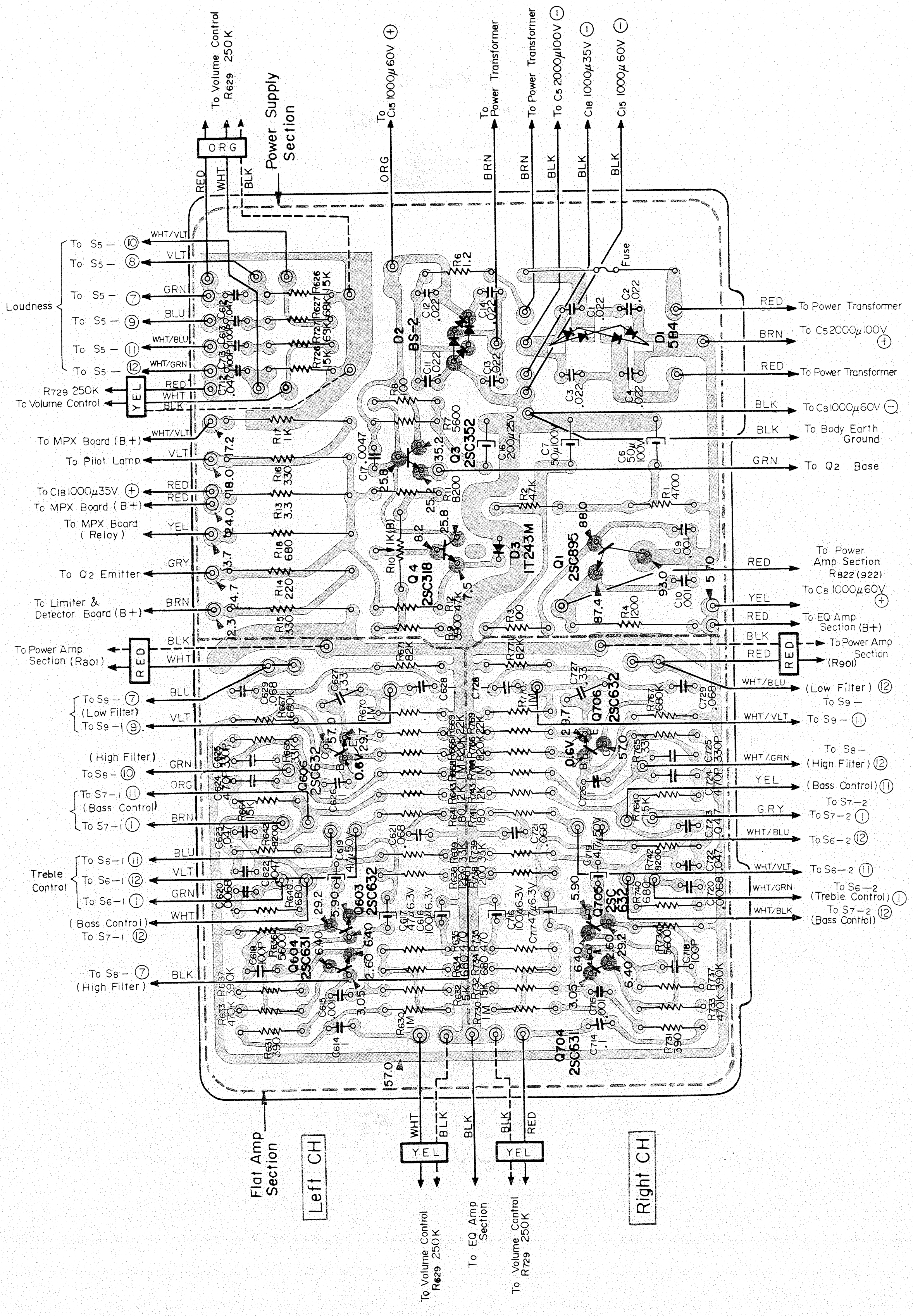
— Conductor Side —


To Volume Control R629 250K
ORG
RED
WHT
BLK
Power Supply Section
To C15 1000μ60V ⊕
ORG
To Power Transformer
BRN
To Power Transformer
BRN
To C5 2000μ100V ⊖
BLK
To C18 1000μ35V ⊖
BLK
To C15 1000μ60V ⊖
BLK
Loudness
To S5 – ⑩
To S5 – ⑧
To S5 – ⑦
To S5 – ⑨
To S5 – ⑪
To S5 – ⑫
WHT/VLT
VLT
GRN
BLU
WHT/BLU
WHT/GRN
R729 250K To Volume Control
YEL
RED
WHT
BLK
To MPX Board (B+)
To Pilot Lamp
To C18 1000μ35V ⊕
To MPX Board (B+)
To MPX Board (Relay)
To Q2 Emitter
To Limiter & Detector Board (B+)
To Power Amp Section (R801)
RED
WHT/VLT
VLT
RED
RED
YEL
GRY
BRN
BLK
WHT
To S9 – ⑦ (Low Filter)
To S9 – ⑨
BLU
VLT
(High Filter) To S8 – ⑩
GRN
ORG
To S7 – ⑪ (Bass Control)
To S7 – ⑪
BRN
Treble Control
To S6 – ⑪
To S6 – ⑫
To S6 – ⑦
BLU
VLT
GRN
WHT
(Bass Control) To S7 – ⑫
To S8 – ⑦ (High Filter)
BLK
D2 BS-2
Q3 2SC352
Q4 2SC318
D3 1T243M
Q1 2SC895
D1 5B4
Fuse
C12 .022
C11 .022
C13 .022
C14 .022
C2 .022
C3 .022
C4 .022
C7 50μ100V
C6 50μ100V
C16 200μ25V
C17 .0047
C9 .001
C10 .001
R6 1.2
R8 100
R11 1K
R16 330
R13 3.3
R18 680
R14 220
R15 330
R7 5600
R1 8200
R2 4.7K
R1 4700
R4 1200
17.2
18.0
24.0
13.7
14.7
12.3
35.2
25.8
25.8
25.8
88.0
87.4
93.0
Q606 2SC632
Q706 2SC632
Q603 2SC632
Q604 2SC631
Q704 2SC631
29.2
5.90
6.40
2.60
3.05
57.0
RED
To Power Transformer
BRN
To C5 2000μ100V ⊕
RED
To Power Transformer
BLK
To C18 1000μ60V ⊖
BLK
To Body Earth Ground
GRN
To Q2 Base
RED
To Power Amp Section R822 (922)
YEL
To C8 1000μ60V ⊕
RED
To EQ Amp Section (B+)
BLK
RED
To Power Amp Section (R901)
WHT/BLU
(Low Filter) ⑫ To S9 –
WHT/VLT
To S9 – ⑪
WHT/GRN
To S8 – (High Filter) ⑫
YEL
(Bass Control) ⑪
GRY
To S7 – 2 To S7 – 2 ⑦
WHT/BLU
To S6 – 2 ⑫
WHT/VLT
To S6 – 2 ⑪
WHT/GRN
To S6 – 2 (Treble Control) ⑦
WHT/BLK
To S7 – 2 ⑫ (Bass Control)
Flat Amp Section
Left CH
WHT
BLK
YEL
BLK
BLK
RED
YEL
Right CH
To Volume Control R629 250K
To EQ Amp Section
To Volume Control R729 250K

Mounting Diagram

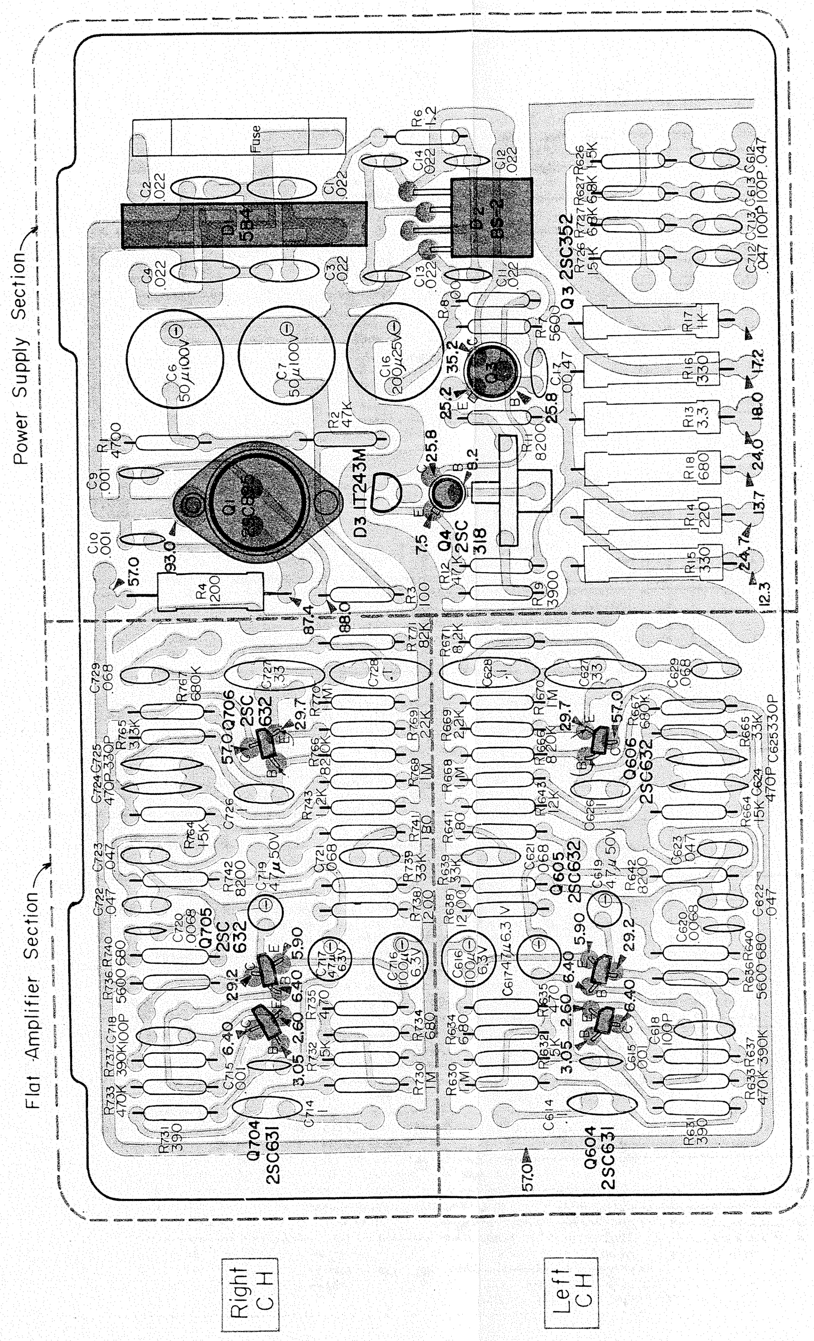
Flat Amplifier & Power Supply Section

— Conductor Side —


To Volume Control R629 250K
Power Supply Section
ORG
RED
WHT
BLK
To C5 1000μ60V ⊕
To Power Transformer
To Power Transformer
To C5 2000μ100V ⊖
To C8 1000μ35V ⊖
To C15 1000μ60V ⊖
ORG
BRN
BRN
BLK
BLK
BLK
Fuse
To S5 − ⑩
To S5 − ⑥
Loudness
To S5 − ⑦
To S5 − ⑨
To S5 − ⑪
To S5 − ⑫
R729 250K To Volume Control
YEL
To MPX Board (B+)
To Pilot Lamp
To C18 1000μ35V ⊕
To MPX Board (B+)
To MPX Board (Relay)
To Q2 Emitter
To Limiter & Detector Board (B+)
To Power Amp Section (R801)
To S9 − ⑦ (Low Filter) To S9 − ⑨
(High Filter) To S8 − ⑩
To S7−1 ⑪ (Bass Control) To S7−1 ①
Treble Control
To S6−1 ⑪
To S6−1 ⑫
To S6−1 ①
(Bass Control) To S7−1 ⑫
To S8 − ⑦ (High Filter)
RED To Power Transformer
BRN To C5 2000μ100V ⊕
RED To Power Transformer
BLK To C8 1000μ60V ⊖
BLK To Body Earth Ground
GRN To Q2 Base
RED To Power Amp Section R822 (922)
YEL To C8 1000μ60V ⊕
RED To EQ Amp Section (B+)
BLK
RED To Power Amp Section (R901)
WHT/BLU (Low Filter) ⑫
WHT/VLT To S9 − ⑪
WHT/GRN To S8 − (High Filter) ⑫
YEL (Bass Control) ⑪
GRY To S7−2 ①
WHT/BLU To S6−2 ⑫
WHT/VLT To S6−2 ⑪
WHT/GRN To S6−2 (Treble Control) ①
WHT/BLK To S7−2 ⑫ (Bass Control)
D2 BS-2
D1 5B4
Q3 2SC352
Q4 2SC318
D3 IT243M
Q1 2SC895
Q603 2SC632
Q604 2SC631
Q704 2SC631
Q705 2SC632
Q706 2SC632
Q606 2SC632
Flat Amp Section
Left CH
Right CH
WHT
BLK
BLK
BLK
RED
YEL
YEL
To Volume Control R629 250K
To EQ Amp Section
To Volume Control R729 250K

Flat Amplifier & Power Supply Section

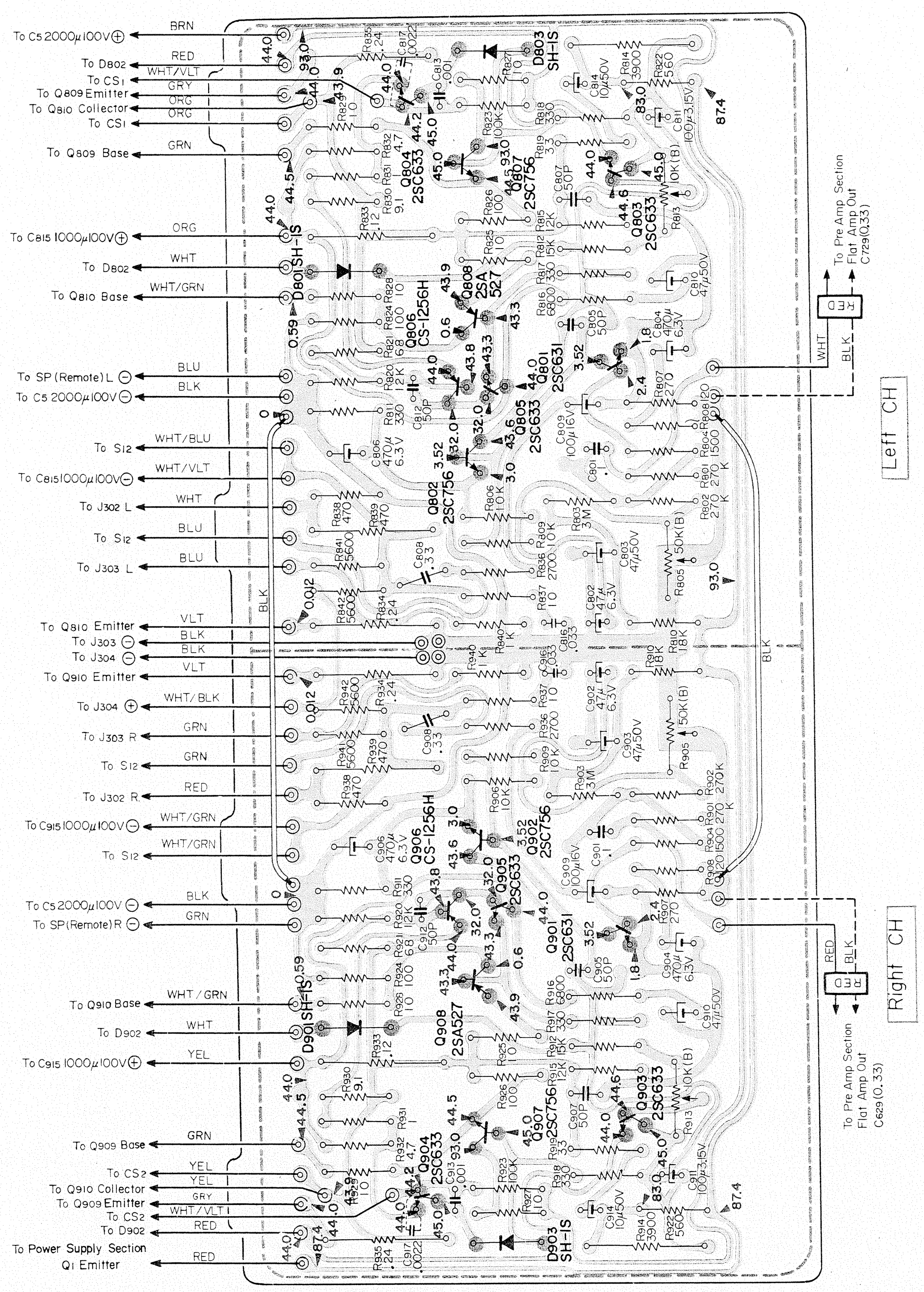
— Component Side —


Power Supply Section
Flat Amplifier Section
Fuse
D1 5B4
D2 BS-2
Q3 2SC352
Q1 2SC895
D3 IT243M
Q4 2SC318
Q706 2SC632
Q606 2SC632
Q605 2SC632
Q705 2SC632
Q704 2SC631
Q604 2SC631
Right CH
Left CH

Mounting Diagram

Power Amplifier Section

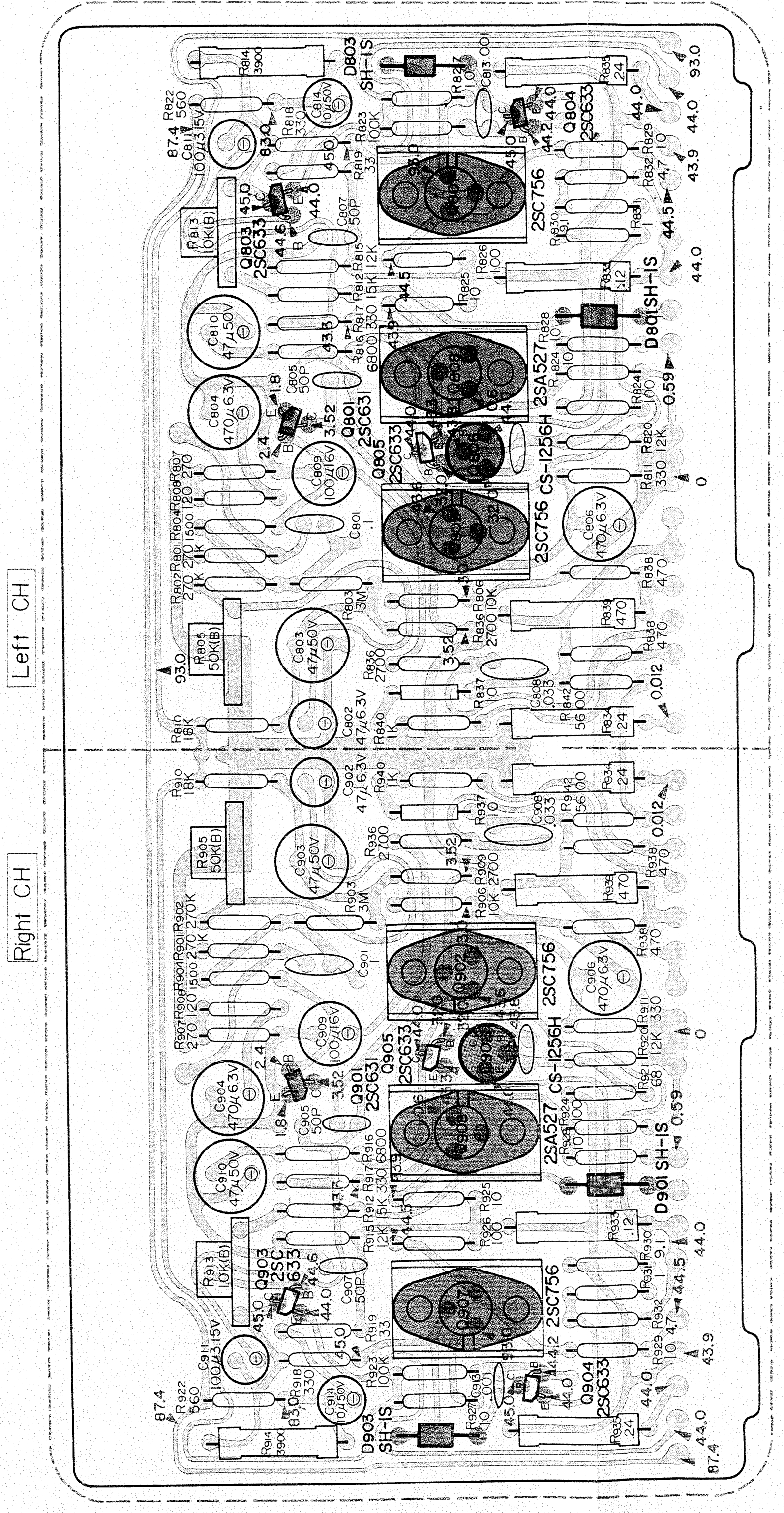
— Conductor Side —

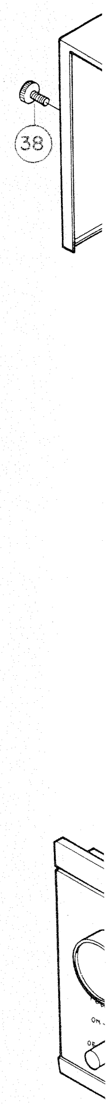

To C5 2000μ100V ⊕
BRN
To D802
RED
To CS1
WHT/VLT
To Q809 Emitter
GRY
To Q810 Collector
ORG
To CS1
ORG
To Q809 Base
GRN
To C815 1000μ100V ⊕
ORG
To D802
WHT
To Q810 Base
WHT/GRN
To SP (Remote) L ⊖
BLU
To C5 2000μ100V ⊖
BLK
To S12
WHT/BLU
To C815 1000μ100V ⊖
WHT/VLT
To J302 L
WHT
To S12
BLU
To J303 L
BLU
To Q810 Emitter
VLT
To J303 ⊖
BLK
To J304 ⊖
BLK
To Q910 Emitter
VLT
To J304 ⊕
WHT/BLK
To J303 R
GRN
To S12
GRN
To J302 R
RED
To C915 1000μ100V ⊖
WHT/GRN
To S12
WHT/GRN
To C5 2000μ100V ⊖
BLK
To SP(Remote) R ⊖
GRN
To Q910 Base
WHT/GRN
To D902
WHT
To C915 1000μ100V ⊕
YEL
To Q909 Base
GRN
To CS2
YEL
To Q910 Collector
YEL
To Q909 Emitter
GRY
To CS2
WHT/VLT
To D902
RED
To Power Supply Section Q1 Emitter
RED
To Pre Amp Section Flat Amp Out C729(0.33)
To Pre Amp Section Flat Amp Out C629(0.33)
WHT
BLK
RED
BLK
Left CH
Right CH
D801 SH-1S
D803 SH-1S
D901 SH-1S
D903 SH-1S
Q801 2SC631
Q802 2SC756
Q803 2SC633
Q804 2SC633
Q805 2SC633
Q806 CS-1256H
Q807 2SC756
Q808 2SA527
Q901 2SC631
Q902 2SC756
Q903 2SC633
Q904 2SC633
Q905 2SC633
Q906 CS-1256H
Q907 2SC756
Q908 2SA527

Mounting Diagram

Power Amplifier Section

— Component Side —

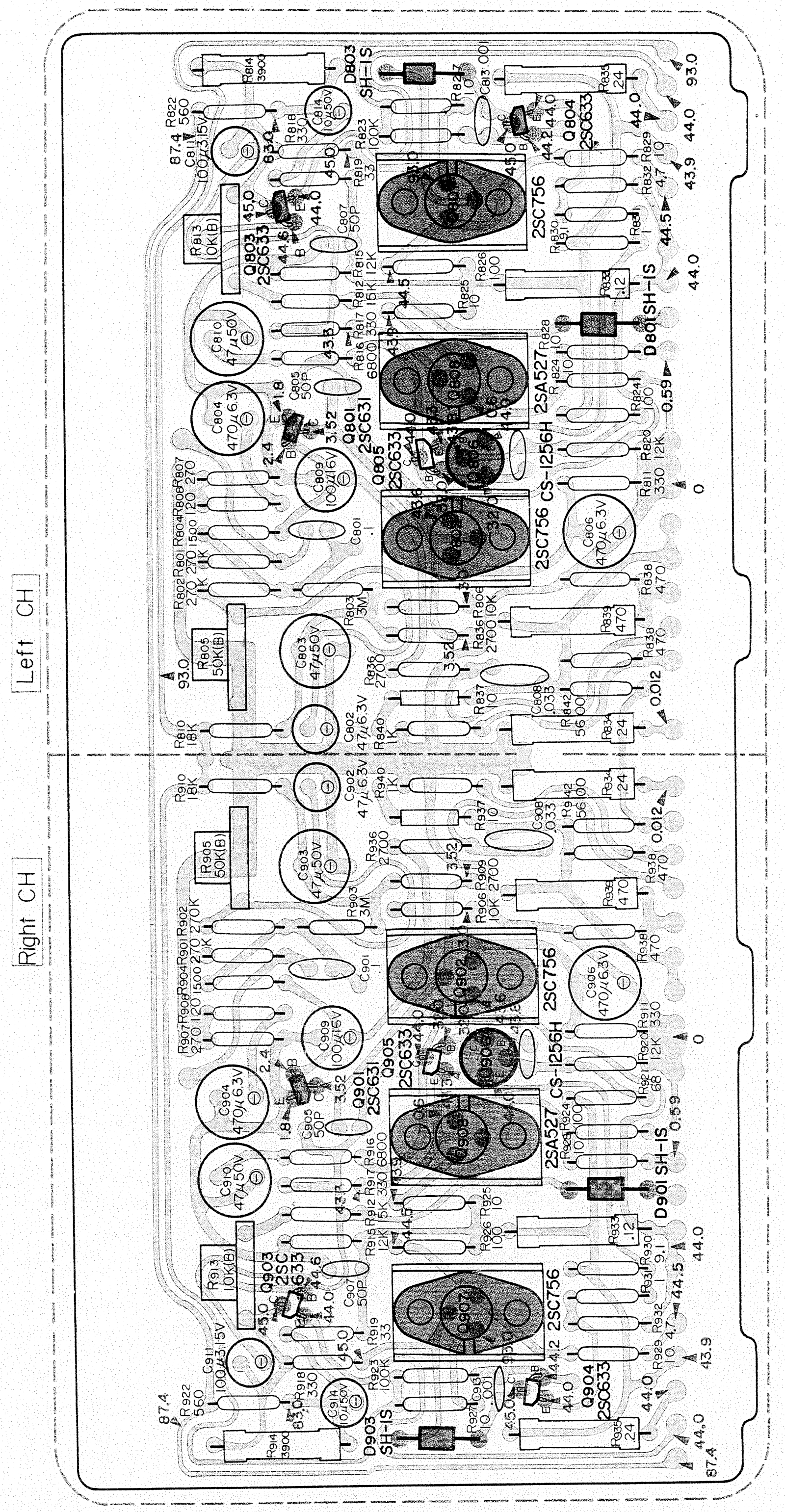

Left CH
Right CH
D801 SH-1S
D803 SH-1S
D901 SH-1S
D903 SH-1S
Q801 2SC631
Q803 2SC633
Q804 2SC633
Q805 2SC633
2SC756
CS-1256H
2SA527
Q901 2SC631
Q903 2SC633
Q904 2SC633
Q905 2SC633



Mounting Diagram

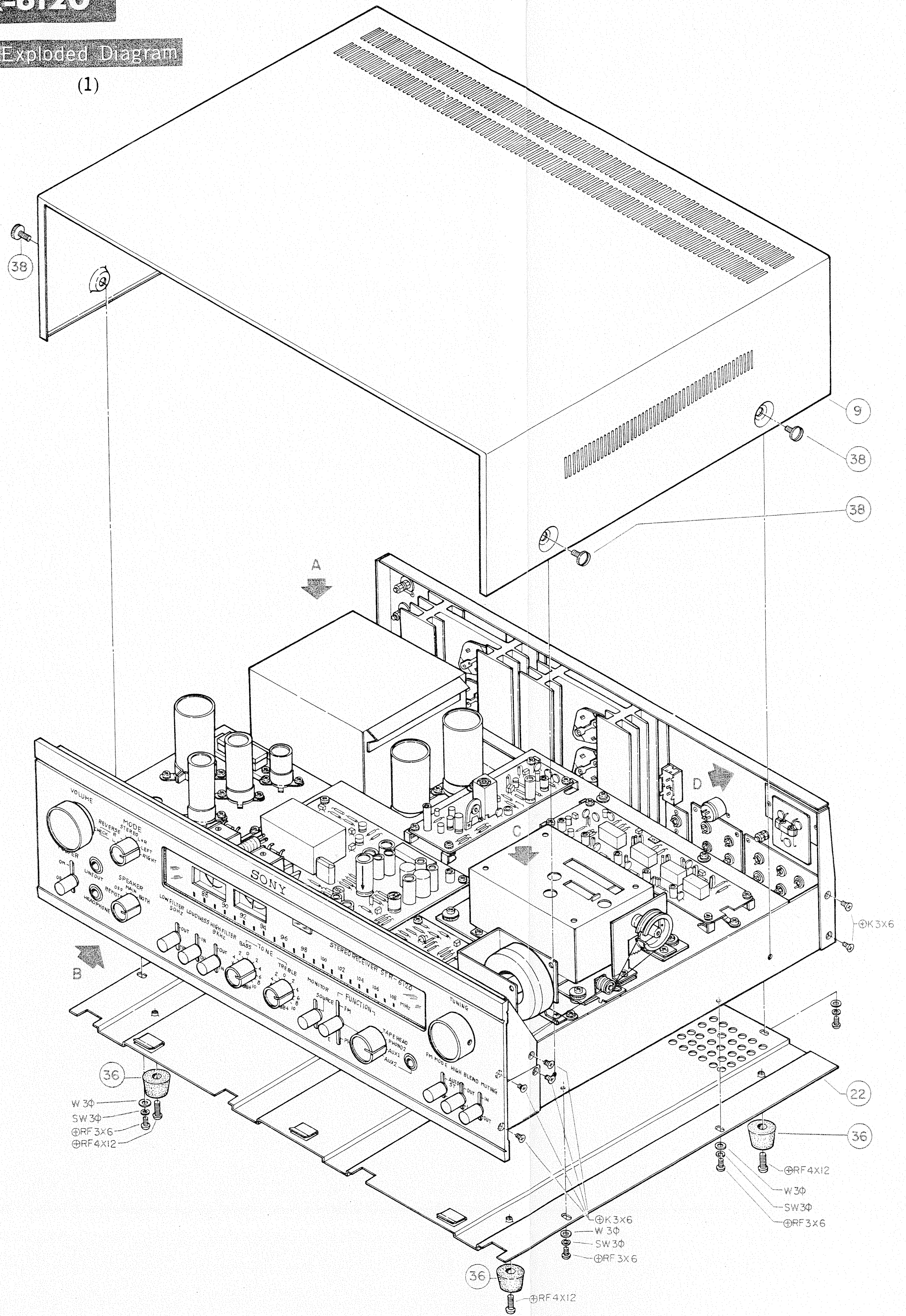
Power Amplifier Section

— Component Side —


Left CH
Right CH
Q801 2SC631
Q803 2SC633
Q804 2SC633
Q805 2SC633
2SC756
2SA527
CS-1256H
D801 SH-1S
D803 SH-1S
Q901 2SC631
Q903 2SC633
Q904 2SC633
Q905 2SC633
D901 SH-1S
D903 SH-1S
93.0
87.4
44.0
44.5
43.9
0.59
0.012

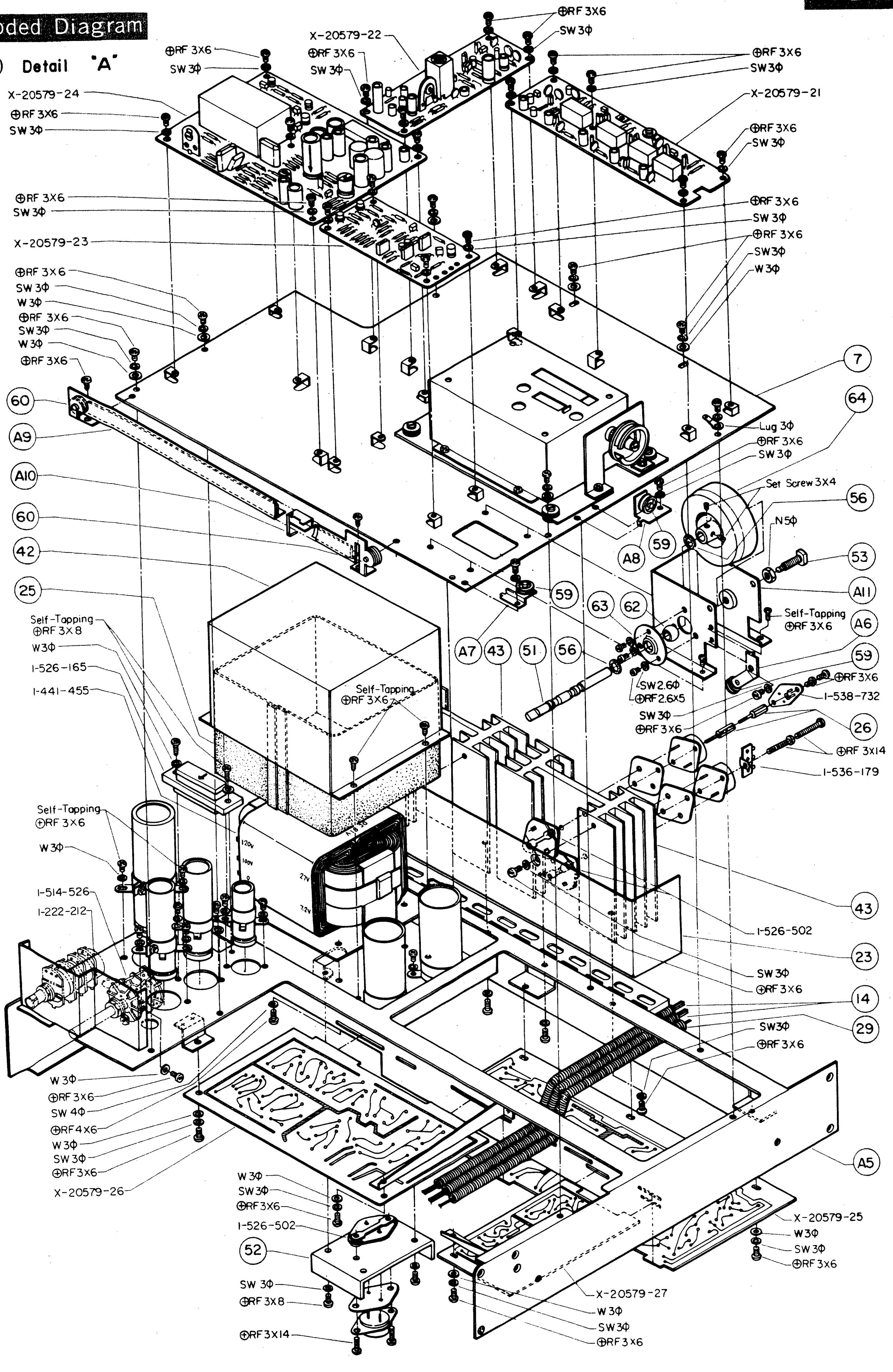
Exploded Diagram

(1)


38
9
38
38
A
B
C
D
VOLUME
MODE
SPEAKER
SONY
TUNING
⊕K3x6
22
36
W3Φ
SW3Φ
⊕RF3x6
⊕RF4x12
36
⊕RF4x12
W3Φ
SW3Φ
⊕RF3x6
⊕K3x6
W3Φ
SW3Φ
⊕RF3x6
36
⊕RF4x12

Exploded Diagram

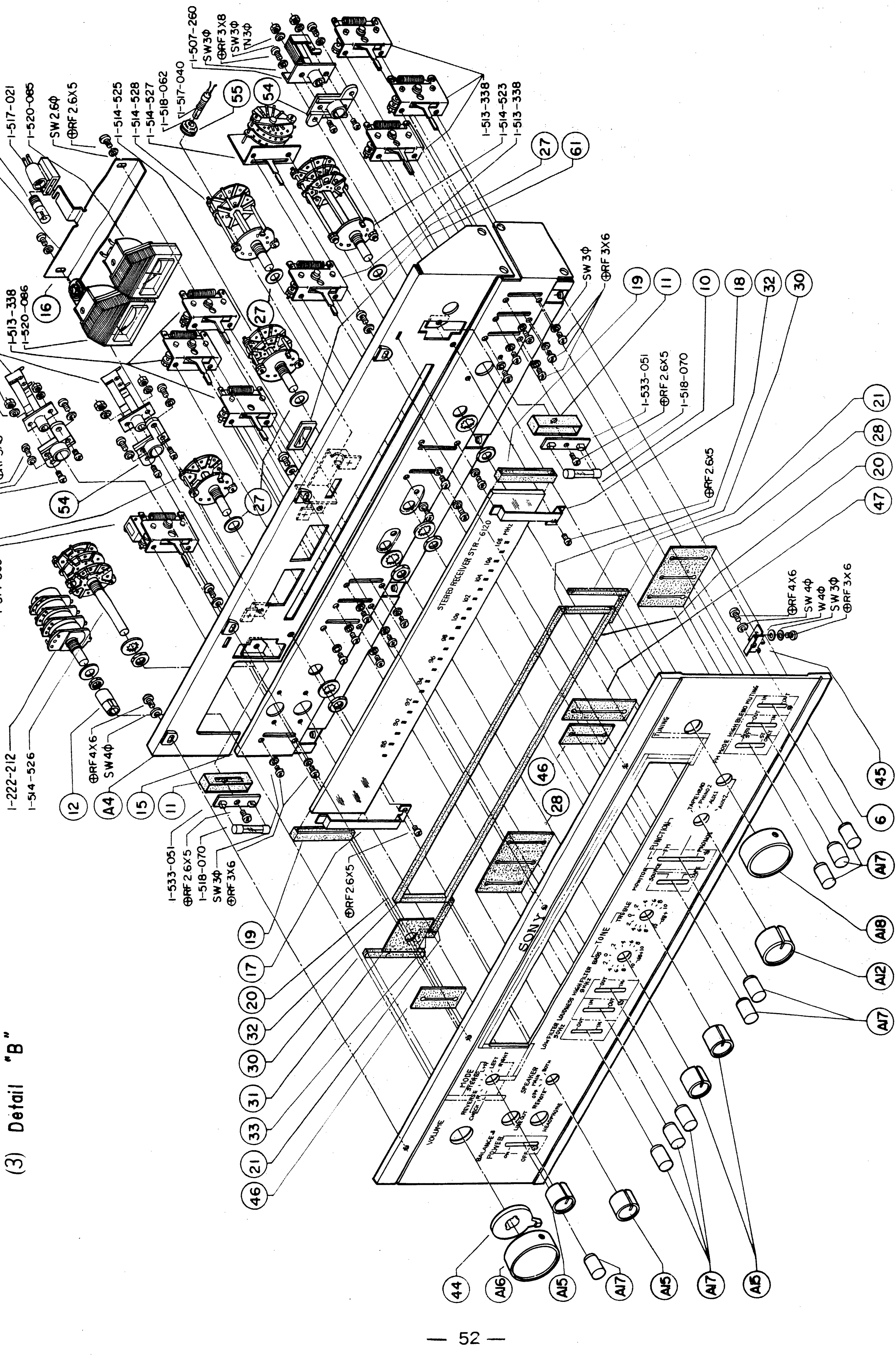
(2) Detail "A"


⊕RF 3X6
SW 3Φ
X-20579-22
⊕RF 3X6
SW 3Φ
⊕RF 3X6
SW 3Φ
⊕RF 3X6
SW 3Φ
X-20579-21
X-20579-24
⊕RF 3X6
SW 3Φ
⊕RF 3X6
SW 3Φ
⊕RF 3X6
SW 3Φ
X-20579-23
⊕RF 3X6
SW 3Φ
⊕RF 3X6
SW 3Φ
W 3Φ
⊕RF 3X6
SW 3Φ
W 3Φ
⊕RF 3X6
SW 3Φ
W 3Φ
⊕RF 3X6
7
60
64
A9
Lug 3Φ
⊕RF 3X6
SW 3Φ
A10
Set Screw 3X4
56
60
N5Φ
A8
59
42
53
59
A11
25
63
62
Self-Tapping
⊕RF 3X6
Self-Tapping
⊕RF 3X8
A6
W 3Φ
A7
43
51
56
59
1-526-165
⊕RF 3X6
1-441-455
Self-Tapping
⊕RF 3X6
SW 2.6Φ
⊕RF 2.6X5
1-538-732
SW 3Φ
⊕RF 3X6
26
⊕RF 3X14
1-536-179
Self-Tapping
⊕RF 3X6
W 3Φ
1-514-526
1-222-212
43
1-526-502
23
SW 3Φ
⊕RF 3X6
14
29
SW 3Φ
⊕RF 3X6
W 3Φ
⊕RF 3X6
SW 4Φ
⊕RF 4X6
W 3Φ
SW 3Φ
⊕RF 3X6
X-20579-26
A5
W 3Φ
SW 3Φ
⊕RF 3X6
1-526-502
X-20579-25
W 3Φ
SW 3Φ
⊕RF 3X6
52
SW 3Φ
⊕RF 3X8
X-20579-27
W 3Φ
SW 3Φ
⊕RF 3X6
⊕RF 3X14

STR-6120

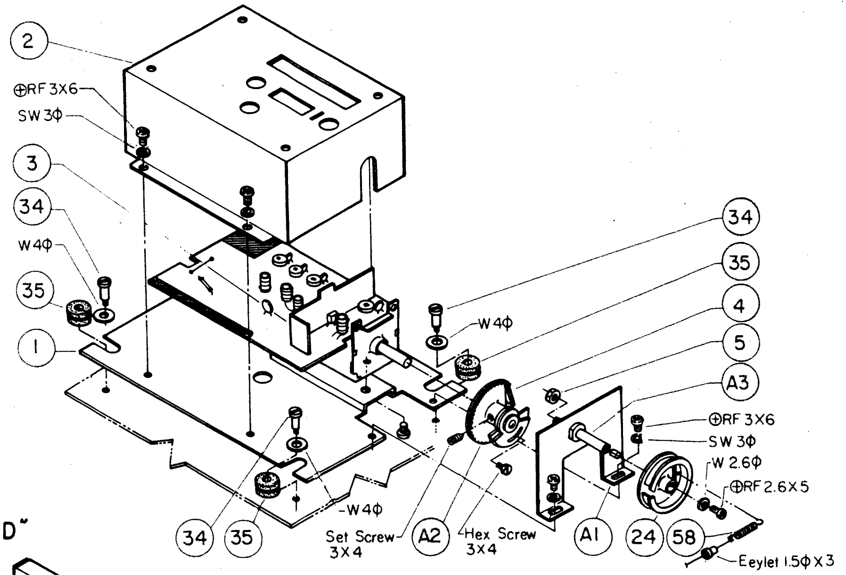
Exploded Diagram

(3) Detail "B"

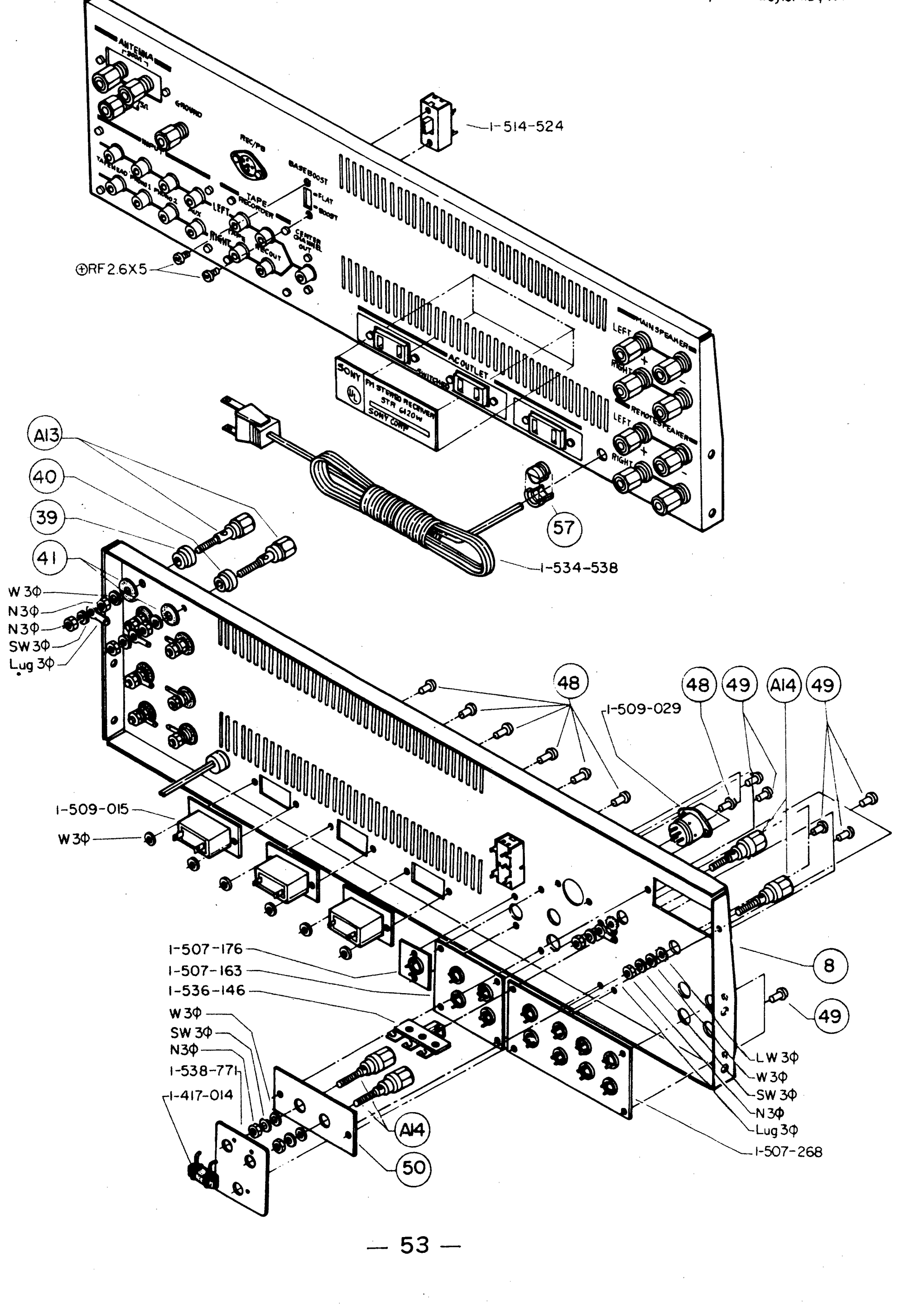

1-221-634
1-518-011
1-517-021
1-520-085
SW 2.6Φ
⊕RF 2.6X5
1-514-525
1-514-528
1-514-527
1-518-062
1-517-040
1-507-260
SW3Φ
⊕RF3X8
SW3Φ
N3Φ
55
54
1-513-338
1-514-523
1-513-338
27
61
SW3Φ
N3Φ
1-507-260
1-513-338
1-520-086
16
27
⊕RF3X10
SW3Φ
⊕RF3X8
54
27
SW 3Φ
⊕RF 3X6
19
11
10
18
32
30
1-533-051
⊕RF 2.6X5
1-518-070
21
28
20
47
⊕RF2.6X5
1-514-522
1-514-369
1-222-212
1-514-526
⊕RF4X6
SW4Φ
12
A4
15
11
1-533-051
⊕RF 2.6X5
1-518-070
SW 3Φ
⊕RF 3X6
⊕RF2.6X5
19
17
20
32
30
31
33
21
46
46
28
⊕RF4X6
SW 4Φ
W 4Φ
SW 3Φ
⊕RF 3X6
45
6
A17
A18
A12
A17
44
A16
A15
A17
A15
A17
A15
STEREO RECEIVER STR-6120
88
90
92
94
96
98
100
102
104
106
108
MHz
SONY
VOLUME
BALANCE & POWER
ON
OFF
MODE
REVERSE
STEREO
CHECK
LEFT
RIGHT
SPEAKER
OFF
MAIN
BOTH
REMOTE
HEADPHONE
LOW FILTER 50Hz
LOUDNESS
HIGH FILTER 9kHz
BASS
TONE
TREBLE
MONITOR
SOURCE
TAPE
FUNCTION
FM
PHONO
TAPE HEAD
PHONO 2
AUX 1
AUX 2
TUNING
FM MODE
HIGH BLEND
MUTING
IN
OUT

Exploded Diagram

(4) Detail "C"


2
⊕RF 3X6
SW 3Φ
3
34
W 4Φ
35
1
34
35
W 4Φ
4
5
A3
⊕RF 3X6
SW 3Φ
W 2.6Φ
⊕RF 2.6X5
-W 4Φ
34
35
Set Screw 3X4
A2
Hex Screw 3X4
A1
24
58
Eeylet 1.5Φ X 3

Detail "D"


1-514-524
⊕RF 2.6X5
A13
40
39
41
57
1-534-538
W 3Φ
N 3Φ
N 3Φ
SW 3Φ
Lug 3Φ
48
1-509-029
48
49
A14
49
1-509-015
W 3Φ
8
49
1-507-176
1-507-163
1-536-146
W 3Φ
SW 3Φ
N 3Φ
1-538-771
1-417-014
A14
50
LW 3Φ
W 3Φ
SW 3Φ
N 3Φ
Lug 3Φ
1-507-268

SONY CORPORATION

Complete Spare Parts List for STR-6120 (E, UL, CSA)

October, 1968

I. Mechanical Parts

i) Front End Section

Ref. No.	Part No.	Description	Q'ty
A1	X-38526-01	Holder Ass'y	1
A2	X-38512-01	Gear Boss Ass'y	1
A3	-03	Drum Shaft Ass'y	1
1	3-852-602	Chassis, front end	1
2	-603	Shield Case, front end	1
3	-604	Plate, shield	1
4	0-029-624	Spring	1
5	3-851-219	Nut, holder	1

ii) Main Chassis Section

Ref. No.	Part No.	Description	Q'ty
A4	X-20579-01	Sub-panel (A) Ass'y (front panel)	1
A5	-02	Chassis Ass'y	1
A6	-05	Bracket (A) Ass'y, pulley support	1
A7	-06	Bracket (B) Ass'y, pulley support	1
A8	-07	Bracket (C) Ass'y, pulley support	1
A9	-08	Guide Ass'y, pointer	1
A10	-09	Pointer Ass'y	1
A11	-10	Bracket Ass'y, flywheel support	1
A12	X-20299-04	Knob (A) Ass'y	1
A13	-05	Binding Post; speaker	8
A14	X-20319-01	Binding Post; antenna	4
A15	X-20320-03	Knob (B) Ass'y	4
A16	X-20437-15	Knob B Ass'y	1
A17	X-20472-09	Knob Ass'y, lever	9
A18	X-38240-07	Knob Ass'y	1
#1..6	2-057-941	Panel, front	1
7	-942	Chassis, front end section	1
#1..8	-943	Panel, rear	1
9	-944	Chassis Cover	1
10	-945	Plate, dial scale	1
11	-946	Cover, light intercepting	2
12	-947	Bushing	1
13	-963	Label, specification (E)	1
#1..6	2-057-988	Panel, front	1
#1..8	-989	Panel, rear	1

Revised

#1....1st Revision
Nov. 1970

Ref. No.	Part No.	Description	Q'ty
14	2-057-949	Conduit, flexible	2
15	-950-02	Sub Chassis (B)	1
16	-951	Bracket, meter support	1
17	-952	Holder (A), dial plate support	1
18	-953	Holder (B), dial plate support	1
19	-954	Cushion, dial plate	2
20	-955	Rubber (A), light intercepting	2
21	-956	Rubber (B), light intercepting	2
22	-957	Plate, bottom	1
23	-958	Cover, heat intercepting	1
24	-959	Drum, tuning	1
25	-960	Plate, insulating; transformer	1
26	-961	Screw C, thermistor supporting	4
27	-962	Washer, rotary switch	4
28	-965	Pad, light intercepting	2
29	-966	Conduit (B), flexible	1
30	-967	Rubber (C), light intercepting	2
31	-968	Cushion (B), light intercepting	1
32	-973	Cushion (D), light intercepting	2
33	-974	Cushion (E), light intercepting	1
34	0-204-214	Screw, front end	4
35	-220	Rubber, front end	4
36	0-051-263	Foot, rubber	4
37	2-029-928	Heat Sink (2SC756, 2SA527)	6
38	-930	Screw, chassis cover	4
39	-935-02	Washer, insulating, blue	4
40	-935-12	Washer, insulating, red	4
41	-936	Washer, insulating, fiber	8
42	2-043-751	Cover, transformer	1
43	-760	Heat Sink (2SD88)	2
44	-769	Knob, balancer	1
45	-776	Bracket, panel holding	4
46	2-047-106	Plate A, light intercepting	2
47	-107	Plate B, light intercepting	1
48	-211-07	Rivet (L=3mm)	8
49	-211-08	Rivet (L=4mm)	12
50	-230	Plate, antenna terminal	1
51	-236	Shaft, tuning	1
52	-237	Heat Sink	1
53	-258	Screw, adjusting	1
54	2-051-919	Escutcheon, jack	3
55	3-401-100	Bushing, stereo lamp	1
56	3-409-124	Spacer (D), nylon t=0.5	2

Ref. No.	Part No.	Description	Q'ty
57	3-410-032	Stopper, power cord	1
58	3-802-520	Spring, tuning drive drum	1
59	3-811-140	Pulley 10ø	4
60	3-817-114	" 8ø	2
61	3-824-019	Escutcheon, stereo indicating	1
62	-039	Spacer, tuning shaft	1
63	-040	End Retainer	1
64	-041	Flywheel	1

II. Screws, Washers & Nuts

7-621-261-63	Screw (+) RF 3 x 10	6
-259-33	" (+) RF 2.6 x 5	10
-261-33	" (+) RF 3 x 5	9
-261-43	" (+) RF 3 x 6	88
-261-53	" (+) RF 3 x 8	9
-268-43	" (+) RF 4 x 6	12
-268-73	" (+) RF 4 x 12	4
-261-83	" (+) RF 3 x 14	6
-561-43	" (+) K 3 x 6	12
-713-27	" , setting 3 x 4	2
-722-40	" , self-tapping (+) RF 3 x 6	20
-722-58	" , " (+) RF 3 x 8	2
-999-72	" , hexagonal head (-) 3 x 4	1
7-622-108-02	Nut 3ø	39
-112-02	" 5ø	1
7-623-107-19	Washer, plain 2.6ø (small)	1
-108-12	" , " 3ø	78
-110-12	" , 4ø	4
-207-21	" , spring 2.6ø	5
-208-21	" , " 3ø	103
-208-22	" , " 3ø	9
-210-21	" , " 4ø	12
-508-01	Lug 3ø	10
-611-00	Eyelet 1.5 x 3	1
-408-01	Washer, lock 3ø	4

III. Attached Items

Instruction Manual	1
Warranty Card	1

Ref. No.	Part No.	Description	Q'ty
	4-404-717	Inspection Card	1
	3-701-020	Polyethylene Bag	1
	-026	Tack Label	1
	-030	Self Label	1
	7-491-001	Desiccant	1
	X-44900-02	Polishing Cloth	1
	2-057-975	Bag, accessory	1
	1-501-083	Antenna, feeder	1
	1-506-113	Plug, short	6
	-138-11	Plug, pin; red	2
	-138-12	" , " ; white	2
	1-534-514-22	Cord, connection RK-81	2
	2-057-969	Carton	1
	-971	Cushion	2
	-972	Bag, polyethylene	1

IV. Electrical Parts

(USA Model...up to Serial No. 82,300
(CANADA Model...up to Serial No. 70,100
(General Export Model... up to Serial No. 51,280

#1... i) Front End Section

Ref. No.	Part No.	Description	Q'ty
	Y-20579-50-1	Front End Completed FF-010A	1
	X-38526-21	Mounted Circuit Board, front end	1
	1-538-989	Printed Circuit Board, front end	1
		Field Effect Transistor TX-133K X101,105	2
		" " " 2SK23 X102	1
		Transistor 2SC629-312 X103	1
		" 2SC629-331 X104	1
	1-401-368	Coil, antenna L101	1
	1-403-295	Transformer, IF IFT101	1
	1-405-375	Coil, oscillator L105	1
	1-425-514	Coil, RF (1) L102	1
	-515	" , RF (2) L103	1
	-516	" , RF (3) L104	1
	1-101-936	Capacitor, mold 0.5pF±10% 500WV C106	1
	1-121-371	" , electrolytic 10µF 25V C113,117	2
	1-141-081	Trimmer, ceramic 3.5 - 10pF CT101 - 105	5
	1-151-189	Capacitor, tuning 5 gang CV101 - 105	1
		Capacitor, ceramic	
	1-101-875	7pF ±0.5pF 50V C121	1

Revised

#1....1st Revision
Nov. 1970

Ref. No.	Part No.	Description				Q'ty
	1-102-893	18pF	±5%	50V	C101,107 ------	2
	1-101-896	20pF	"	"	C102 ----------	1
	-142	0.02µF	(+80% -20%	"	C102,111,112, 114 - 116, 123,124 ------	8
	1-102-879	16pF	±5%	"	C103,108 ------	2
	-077	0.01µF		"	C104,105,109, 118,119 ------	5
		Resistor, carbon				
	1-244-642	51Ω	±5%	RD1/4SR	R105,111,113 --	3
	-657	220Ω	"	"	R102 ----------	1
	-661	330Ω	"	"	R112 ----------	1
	-665	470Ω	"	"	R104 ----------	1
	-666	510Ω	"	"	R116 ----------	1
	-673	1kΩ	"	"	R108,110 ------	2
	-677	1.5kΩ	"	"	R115 ----------	1
	-685	3.3kΩ	"	"	R114 ----------	1
	-689	4.7kΩ	"	"	R107 ----------	1
	-692	6.2kΩ	"	"	R118 ----------	1
	-697	10kΩ	"	"	R106,117 ------	2
	-708	30kΩ	"	"	R103 ----------	1
	-753	2.2MΩ	"	"	R101 ----------	1
	-648	91Ω	"	"	R119 ----------	1

#1..i)' Front End Section (USA Model...Serial No. 82,301 and later
(CANADA Model...Serial No. 70,101 and later
(General Export Model...
Serial No. 51,281 and later

Part No.	Description		Q'ty
8-982-592-10	Front End Ass'y, FF-010BW --------------		1
1-538-989	Printed Circuit Board, front end -------		1
1-539-510	Printed Circuit Board, front end -------		1
	FET, 2SK23	Q101,102,105 --	3
	Transistor, 2SC629	Q103 ----------	1
	Transistor, 2SC710	Q104 ----------	1
	Diode, 1T243	D102 ----------	1
	Diode, 1S351	D101 ----------	1
1-401-368	Coil, antenna	L101 ----------	1
1-403-295	IFT, fm	IFT101 --------	1
1-405-375	Coil, fm osc.	L105 ----------	1

Revised

#1....1st Revision
Nov. 1970

Ref. No.	Part No.	Description		Q'ty
	1-425-514	Coil, fm rf (1)	L102	1
	1-425-515	Coil, fm rf (2)	L103	1
	1-425-516	Coil, fm rf (3)	L104	1
	1-141-081	Capacitor, ceramic trimmer 3.5 - 10 pF	CT101 - 104	4
	-094	Capacitor, ceramic trimmer 8 - 12 p	CT105	1
	1-151-189	Capacitor, tuning	CV101 - 105	1
		Capacitor, ceramic		
	1-102-893	18pF ±5% 50V	C101,107	2
	1-101-073	0.02µF (+80 / -20)% 25V	C102,111,112, 114,115,116, 123,124,127, 129	10
	-936	0.5pF ±10% 500V	C106	1
	1-102-985	180pF ±5% 50V	C110	1
	-879	16pF " "	C103,108	2
	-077	0.01µF ±20% "	C104,105,109, 118,119	5
	1-121-472	10µF (+100 / -10)% 25V	C113,117	2
	1-102-875	7pF ±0.5pF 50V	C121	1
	-872	5pF " "	C126	1
	-874	15pF ±5% "	C120	1
		Capacitor, mylar		
	1-105-685-12	0.1µF ±10% 50V	C128	1
		Resistor, carbon		
	1-244-642	51Ω ±5% RD1/4SR	R105,111,113	3
	-648	91Ω " "	R119	1
	-657	220Ω " "	R102	1
	-661	330Ω " "	R112	1
	-665	470Ω " "	R104	1
	-666	510Ω " "	R116	1

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Ref. No.	Part No.	Description				Q'ty
	1-244-673	1kΩ	±5%	RD1/4SR	R108,110 ------	2
	-677	1.5kΩ	"	"	R115 ----------	1
	-684	3kΩ	"	"	R121 ----------	1
	-685	3.3kΩ	"	"	R114 ----------	1
	-689	4.7kΩ	"	"	R107 ----------	1
	-697	10kΩ	"	"	R106,117 ------	2
	-699	12kΩ	"	"	R118 ----------	1
	-708	30kΩ	"	"	R103 ----------	1
	-721	100kΩ	"	"	R120 ----------	1
	-753	2.2MΩ	"	"	R101 ----------	1

ii) IF Section

Part No.	Description		Q'ty
X-20579-21	Mounted Circuit Board, IF circuit ------		1
1-538-988	Printed Circuit Board, IF circuit ------		1
	Transistor 2SC403A	Q201 - 206 ----	6
	Diode 1T243	D201 - 208 ----	8
	" 1T22A	D209,210 ------	2
	" 1S1555	D211 ----------	1
1-221-986	Resistor, adjustable 330Ω	R211 ----------	1
1-403-297-11	Filter, ceramic CF201 - 208	-11 (RED) -	8
-12		-12 (BLK)	
-13		-13 (WHT)	
1-407-165	Inductor, micro 47μH	L201,203 ------	2
-177	" , " 470μH	L204 ----------	1
-187	" , " 5.6μH	L202 ----------	1
	#1....Diode, 1S1555	D212,213 ------	2

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Ref. No.	Part No.	Description				Q'ty
		Capacitor, ceramic				
#1....	1-101-072	0.01µF	(+80 -20%	25V	C208,213,217, 219,223 - 225, 227,233 -------	9
	-073	0.02µF	"	"	C201,202,204 - 206, 209,210,212, 214,216,218, 220,221,226, 228,230,231 ---	17
#1....	-864	20pF	"	"	C234 -----------	1
		Capacitor, electrolytic				
	1-121-442	1µF	(+100 -10%	15WV	C229 -----------	1
	-472	10µF	(+150 -10%	20WV	C203,207,211, 215,222 -------	5
		Resistor, carbon				
	1-242-649	100Ω	±5%	RD1/4UR	R242,240 -------	2
	-653	150Ω	"	"	R203,210,214, 216,221,224, 226,231 -------	8
#1....	-656	200Ω	"	"	R234,236,252 ---	3
	-660	300Ω	"	"	R249 -----------	1
	-673	1kΩ	"	"	R204,205,213, 247 -----------	4
	-685	3.3kΩ	"	"	R201,208,219, 229 -----------	4
	-698	11kΩ	"	"	R245 -----------	1
	-721	100kΩ	"	"	R241 -----------	1
	-741	680kΩ	"	"	R248 -----------	1
	1-244-642	51Ω	"	RD1/4SR	R207,218,227 ---	3
	-665	470Ω	"	"	R243 -----------	1
	-671	820Ω	"	"	R206,217,228, 250 -----------	4
	-673	1kΩ	"	"	R212,222,223, 232,233,239 ---	6
	-677	1.5kΩ	"	"	R202,209,220, 230 -----------	4
	-680	2kΩ	"	"	R246 -----------	1
	-689	4.7kΩ	"	"	R238 -----------	1

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Ref. No.	Part No.	Description				Q'ty
	1-244-701	15kΩ	±5%	RD1/4SR	R237 -----------	1
	-708	30kΩ	"	"	R244 -----------	1
	-721	100kΩ	"	"	R215,225,235 ---	3

iii) Limiter & Detector Section

Ref. No.	Part No.	Description			Q'ty
	X-20579-22	Mounted Circuit Board, limiter & detector section --------------------			1
	1-538-773	Printed Circuit Board, limiter & detector section --------------------			1
		Transistor	2SC403A	Q301 - 303 -----	3
		"	2SC633	Q304 -----------	1
		Diode	1T243	D301 - 304 -----	4
		"	1T22A	D305,306 -------	2
	1-221-389	Resistor, adjustable	5kΩ	R319 ----------	1
	1-403-291	Transformer, discriminator		IFT301 ------	1
	1-407-165	Inductor, micro	47μH	L301,302 -------	2

Capacitor, ceramic

Ref. No.	Part No.	Description				Q'ty
	1-101-882	51pF	±5%	50V	C320 -----------	1
	-919	0.002μF	$(^{+80}_{-20}\%$	25V	C304,305,309, 310 -----------	4
	-073	0.02μF	"	"	C301 - 303,308, 312,313,321 ---	7

Capacitor, styrol

Ref. No.	Part No.	Description				Q'ty
	1-103-603	120pF	±5%	50V	C317,318 -------	2

Capacitor, electrolytic

Ref. No.	Part No.	Description				Q'ty
	1-121-343	1μF	$(^{+100}_{-10}\%$	50V	C322 -----------	1
	-471	10μF	"	16V	C314 -----------	1
	-472	10μF	"	25V	C325 -----------	1
	-373	33μF	"	"	C319 -----------	1
	-338	47μF	"	16V	C306,323 -------	2
	-377	100μF	"	25V	C311,324 -------	2

Ref. No.	Part No.	Description	Q'ty
		Resistor, carbon	
	1-242-649	100Ω ±5% RD1/4UR R312 -----------	1
	-659	270Ω " " R306 -----------	1
	1-244-649	100Ω " RD1/4SR R305,308,316, 317 -----------	4
	-666	510Ω " " R329 -----------	1
	-669	680Ω " " R303,310,315 ---	3
	-670	750Ω " " R318 -----------	1
	-673	1kΩ " " R304,311 -------	2
	-680	2kΩ " " R323,327,328 ---	3
	-689	4.7kΩ " " R313 -----------	1
	-691	5.6kΩ " " R301 -----------	1
	-693	6.8kΩ " " R320,321 -------	2
	-695	8.2kΩ " " R307 -----------	1
	-699	12kΩ " " R302,309 -------	2
	-701	15kΩ " " R314 -----------	1
	-709	33kΩ " " R322,324 -------	2
	-721	100kΩ " " R325 -----------	1
	-725	150kΩ " " R326 -----------	1
	iv) Muting Section		
	X-20579-23	Mounted Circuit Board, muting circuit --	1
	1-538-774	Printed Circuit Board, muting circuit --	1
		Field Effect Transistor 2SK23 Q401 -----	1
		Transistor 2SC633-7 Q402 - 409 -----	8
		" 2SC633-8 Q410 -----------	1
		Diode 10D-05 D406 -----------	1
		" 1T22A D401 - 405 -----	5
		Thermistor S-10K Th401 ----------	1
	1-221-997	Resistor, adjustable 2.2kΩ R403 ----	1
	1-407-177	Inductor, micro 470μH L401,402 -------	2
		Capacitor, ceramic	
	1-101-269	13pF ±5% 50V C402 -----------	1
	-073	0.02μF (+80% -20%) 25V C406 -----------	1
		Capacitor, mylar	
	1-105-683	0.068μF ±10% 50V C403 - 405 -----	3

Ref. No.	Part No.	Description				Q'ty
	1-105-419	0.22μF	±20%	50V	C407 -----------	1
		Capacitor, electrolytic				
	1-121-472	10μF		25V	C401 -----------	1
		Resistor, carbon				
	1-244-649	100Ω	±5%	RD1/4SR	R419 -----------	1
	-655	180Ω	"	"	R424 -----------	1
	-656	200Ω	"	"	R402,409,411 ---	3
	-666	510Ω	"	"	R427,431 -------	2
	-673	1kΩ	"	"	R423 -----------	1
	-683	2.7kΩ	"	"	R404 -----------	1
	-691	5.6kΩ	"	"	R418 -----------	1
	-693	6.8kΩ	"	"	R406 -----------	1
	-695	8.2kΩ	"	"	R417 -----------	1
	-697	10kΩ	"	"	R405,415,420, 435,436 -------	5
	-701	15kΩ	"	"	R422 -----------	1
	-704	20kΩ	"	"	R426,428 -------	2
	-708	30kΩ	"	"	R408 -----------	1
	-713	47kΩ	"	"	R429 -----------	1
	-714	51kΩ	"	"	R410,414,416 ---	3
	-715	56kΩ	"	"	R434 -----------	1
	-721	100kΩ	"	"	R412,413,425, 430 -----------	4
	-732	300kΩ	"	"	R421 -----------	1
	-744	910kΩ	"	"	R401 -----------	1
	-713	47kΩ	"	"	R407 (to be selected) -----	1/3
	-714	51kΩ	"	"	R407 (") -----	1/3
	-715	56kΩ	"	"	R407 (") -----	1/3

v) Stereo Demodulator Section

Part No.	Description			Q'ty
X-20579-24	Mounted Circuit Board, stereo demodulator circuit ------------------			1
1-538-775	Printed Circuit Board, demodulator circuit ------------------------------			1
	Transistor	2SC633	Q501 - 515 -----	15
	Diode	1T22A	D503 - 507 -----	5
	"	1T23	D501 - 502 -----	2

9/19 (STR-6120E, UL, CSA)

Ref. No.	Part No.	Description		Q'ty
	1-221-389	Resistor, adjustable 5kΩ	R537 ---------	1
	1-231-066	Filter, lowpass	LPF501 -------	1
	1-409-138	Coil, trap (19 kHz)	L505 ---------	1
	-139	Coil, trap (67 kHz)	L506 ---------	1
	1-425-401	Transformer, MPX	L503 ---------	1
	-402	" , "	L504 ---------	1
	-403	" , "	L501,502 -----	2
	1-515-101	Relay	REL-1 --------	1

Capacitor, styrol

Ref. No.	Part No.	Description		Q'ty
	1-103-605	150pF ±5% 50V	C504 ----------	1
	-611	270pF " "	C521,522 ------	2
	-575	4700pF " "	C502,505,507-509, 513 ----------	6

Capacitor, mylar

Ref. No.	Part No.	Description		Q'ty
	1-105-661-12	0.001μF ±10% 50V	C506,512 ------	2
	-665-12	0.002μF " "	C529 ----------	1
#1..	-681-12	0.047μF " "	C514,515 ------	2
	1-106-550	0.33μF " 35V	C518,519,523, 524 ----------	4

Capacitor, mylar (to be selected)

Ref. No.	Part No.	Description		Q'ty
#1..	1-105-667-12	0.0033μF ±10% 50V	C516,517 ------	2
#1..	-669-12	0.0047μF " "	C516,517 ------	2
#1..	-667-12	0.0033μF " "	C536,537 ------	2
#1..	-677-12	0.022μF " "	C536,537 ------	2

Capacitor, electrolytic

Ref. No.	Part No.	Description		Q'ty
	1-121-343	1μF 50V	C520,528 ------	2
	-472	10μF 25V	C525,526 ------	2
	-485	33μF 16V	C501 ----------	1
	-489	4.7μF 12.5V	C532 ----------	1
	-375	47μF 25V	C530 ----------	1
	-491	100μF 6.3V	C503 ----------	1
	-377	100μF 25V	C511,520 ------	2
	-426	470μF 16V	C531 ----------	1

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Ref. No.	Part No.	Description				Q'ty
		Resistor, carbon				
	1-244-641	47Ω	±5%	RD1/4SR	R574	1
	-649	100Ω	"	"	R516	1
	-658	240Ω	"	"	R506	1
	-666	510Ω	"	"	R519,520 - 522, 551,552,559, 560,563,564	10
	-670	750Ω	"	"	R512	1
	-673	1kΩ	"	"	R503,515,518, 525,526,533, 534	7
	-675	1.2kΩ	"	"	R501	1
	-677	1.5kΩ	"	"	R539,540,573	3
	-680	2kΩ	"	"	R538,541,542	3
	-684	3kΩ	"	"	R517,543 - 546, 575	6
	-685	3.3kΩ	"	"	R523,524,576	3
	-690	5.1kΩ	"	"	R514,557,558	3
	-697	10kΩ	"	"	R535,536,553, 554,567,568, 573,578	8
	-701	15kΩ	"	"	R505,555,556, 561,562	5
	-708	30kΩ	"	"	R510	1
	-712	43kΩ	"	"	R509	1
	-714	51kΩ	"	"	R504	1
	-715	56kΩ	"	"	R565,566	2
	-718	75kΩ	"	"	R507,513	2
	-721	100kΩ	"	"	R508,511,527, 528	4
	-734	360kΩ	"	"	R502	1
	-743	820kΩ	"	"	R529,530	2
	-744	910kΩ	"	"	R549,550	2
	-649	100Ω	"	"	R531,532 (to be selected)	2/3
	-656	200Ω	"	"	R531,532 (")	2/3
	-660	300Ω	"	"	R531,532 (")	2/3
	-718	75kΩ	"	"	R547,548 (to be selected)	2/2
	-719	82kΩ	"	"	R547,548 (")	2/2

vi) Equalizer Amplifier Section

Ref. No.	Part No.	Description				Q'ty
	X-20579-27	Mounted Circuit Board, equalizer amp section				1
	1-538-937	Printed Circuit Board, equalizer amp section				1
		Transistor 2SC631			Q601,701	2
		" 2SC632			Q602,603,702,703	4
		Capacitor, mylar				
	1-105-821-12	0.001µF	±20%	50V	C603,703	2
	-503-12	0.0015µF	"	"	C609,709	2
#1....	~~-506~~	~~0.0027µF~~	~~"~~	~~"~~	~~C611,711~~	~~2~~
	-510-12	0.0056µF	"	"	C608,708	2
	-420-12	0.33µF	"	35V	C602,702	2
		Capacitor, silvered mica				
	1-107-004	100µF	±10%	500V	C605,705	2
#1....	~~-008~~	~~150pF~~	~~"~~	~~"~~	~~C610,710~~	~~2~~
		Capacitor, electrolytic				
	1-121-346	4.7µF		50V	C601,607,701,707	4
	-347	10µF		16V	C604,704	2
	-322	47µF		6.3V	C606,706	2
		Resistor, carbon				
	1-210-051	2.2MΩ	±5%	RD1/4P	R612,712	2
	1-244-657	220Ω	"	RD1/4SR	R617,717	2
	-661	330Ω	"	"	R616,716	2
	-665	470Ω	"	"	R610,710	2
	-683	2.7kΩ	"	"	R621,721	2
	-687	3.9kΩ	"	"	R609,709	2
	-691	5.6kΩ	"	"	R618,718	2
	-695	8.2kΩ	"	"	R625,725	2
	-701	15kΩ	"	"	R611,711	2
#1....	~~-702~~	~~16kΩ~~	~~"~~	~~"~~	~~R623,723~~	~~2~~
#1....	-721	100kΩ	"	"	R615	1

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Ref. No.	Part No.	Description				Q'ty
#1..	1-244-725	150kΩ	±5%	RD1/4SR	R606 -----------	1
	-709	33kΩ	"	"	R619,719 -------	2
	-713	47kΩ	"	"	R622,722 -------	2
	-743	820kΩ	"	"	R607,614,707, 714 -----------	4
	-745	1MΩ	"	"	R613,620,713, 720 -----------	4
	-753	2.2MΩ	"	"	R608,708 -------	2

vii) Preamplifier Section

X-20579-26	Mounted Circuit Board, preamplifier ----		1
1-538-936	Printed Circuit Board, " ----		1
	Transistor 2SC318A	Q4 ------------	1
	" 2SC352A	Q3 ------------	1
	" 2SC631	Q604,704 -------	2
	" 2SC632	Q605,606,705,706	4
	" 2SC895	Q1 ------------	1
	Diode 1T243M	D3 ------------	1
	" BS-2	D2 ------------	1
	" 5B4	D1 ------------	1
1-221-964	Resistor, adjustable 1kΩ	R10 ----------	1
1-532-083	Fuse 5A	F ------------	1

Capacitor, mylar

1-105-821-12	0.001μF	±20%	50V	C615,715 -------	2
-861-12	0.001μF	"	100V	C9,10 ----------	2
-829-12	0.0047μF	"	50V	C17 ------------	1
-671-12	0.0068μF	±10%	"	C620,720 -------	2
-917-12	0.022μF	±20%	200V	C1 - 4 ---------	4
-877-12	0.022μF	"	100V	C11 - 14 -------	4
-681-12	0.047μF	±10%	50V	C712,722,723, 612,622,623 ---	6
-683-12	0.068μF	"	"	C621,629,721, 729 -----------	4
-685-12	0.1μF	"	"	C614,626,628, 714,726,728 ---	6
-691-12	0.33μF	"	"	C627,727 -------	2

Capacitor, silvered mica

1-107-004	100pF	±10%	500V	C613,618,713,718	4

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Ref. No.	Part No.	Description				Q'ty
	1-107-006	330pF	±10%	500V	C625,725 -------	2
	-016	470pF	"	"	C624,724 -------	2
		Capacitor, electrolytic				
	1-121-346	4.7µF		50V	C619,719 -------	2
	-322	47µF		6.3V	C617,717 -------	2
	-559	50µF		100V	C6,7 -----------	2
	-291	100µF		6.3V	C616,717 -------	2
	-005	200µF		25V	C16 ------------	1
		Resistor, metal oxide				
	1-206-129	1.2kΩ	±10%	2W	R4 -------------	1
		Resistor, carbon				
	1-209-142	3.3Ω	±5%	RD1P	R13 ------------	1
	-162	220Ω	"	"	R14 ------------	1
	1-204-277	330Ω	"	"	R15,16 ---------	2
	-074	680Ω	"	"	R18 ------------	1
	1-203-033	1kΩ	"	"	R17 ------------	1
	1-244-603	1.2Ω	"	RD1/4SR	R6 -------------	1
	-649	100Ω	"	"	R3,8 -----------	2
	-655	180Ω	"	"	R641,741 -------	2
	-663	390Ω	"	"	R631,731 -------	2
	-665	470Ω	"	"	R635,735 -------	2
	-669	680Ω	"	"	R634,640,734, 740 -----------	4
	-675	1.2kΩ	"	"	R638,738 -------	2
	-687	3.9kΩ	"	"	R9 -------------	1
	-689	4.7kΩ	"	"	R1,2 -----------	2
	-691	5.6kΩ	"	"	R7,636,736 -----	3
	-695	8.2kΩ	"	"	R11,642,742 ----	3
	-699	12kΩ	"	"	R643,743 -------	2
	-701	15kΩ	"	"	R626,632,664, 726,732,764 ---	6
	-705	22kΩ	"	"	R669,769 -------	2
	-709	33kΩ	"	"	R639,665,739, 765 -----------	4
	-713	47kΩ	"	"	R12 ------------	1
	-717	68kΩ	"	"	R627,727 -------	2

Ref. No.	Part No.	Description				Q'ty
	1-244-719	82kΩ	±5%	RD1/4SR	R671,771	2
	-735	390kΩ	"	"	R637,737	2
	-737	470kΩ	"	"	R633,733	2
	-741	680kΩ	"	"	R667,767	2
	-743	820kΩ	"	"	R666,766	2
	-745	1MΩ	"	"	R630,668,670, 730,768,770	6

viii) Power Amplifier Section

X-20579-25	Mounted Circuit Board, power amp section			1
1-538-935	Printed Circuit Board, power amp section			1
	Transistor	2SA527	Q808,908	2
	"	2SC631	Q801,901	2
	"	2SC633	Q803 - 805, 903 - 905	6
	"	2SC756	Q802,807,902, 907	4
	"	CS-1256H	Q806,906	2
	Diode	SH-1S	D801,803,901,903	4
1-221-965	Resistor, adjustable	50kΩ	R805,905	2
-967	" , "	10kΩ	R813,913	2

Capacitor, mylar

1-105-821-12	0.001μF	±20%	50V	C813,913	2
-679-12	0.033μF	±10%	"	C816,916	2
-685-12	0.1μF	"	"	C801,901	2
-691-12	0.33μF	"	"	C808,908	2
-665-12	0.0022μF	"	"	C817,917	2

Capacitor, silvered mica

1-107-002	50pF	±10%	500V	C805,807,812, 905,907,912	6

Capacitor, electrolytic

1-121-348	10μF	50V	C814,914	2
-322	47μF	6.3V	C802,902	2

Ref. No.	Part No.	Description				Q'ty
	1-121-354	47µF	50V		C803,810,903, 910	4
	-290	100µF	3.15V		C811,911	2
	-356	100µF	16V		C809,909	2
	-359	470µF	6.3V		C804,806,904, 906	4
		Resistor, composition				
	1-201-696	10Ω	±10%	RC1/2	R837,937	2
	-706	470Ω	"	"	R838,938	2
		Resistor, wire wound				
	1-207-174	0.24Ω	±10%	1.5W	R834,835,934, 935	4
	-194	0.12Ω	"	"	R833,933	2
		Resistor, carbon				
	1-209-165	470Ω	±5%	RD1P	R839,939	2
	-172	3.9kΩ	"	"	R814,914	2
	1-244-601	1Ω	"	RD1/4SR	R831,931	2
	-617	4.7Ω	"	"	R832,932	2
	-624	9.1Ω	"	"	R830,930	2
	-625	10Ω	"	"	R825,827 - 829, 925,927 - 929	8
	-637	33Ω	"	"	R819,919	2
	-645	68Ω	"	"	R821,921	2
	-649	100Ω	"	"	R824,826,924, 926	4
	-651	120Ω	"	"	R808,908	2
	-659	270Ω	"	"	R807,907	2
	-661	330Ω	"	"	R811,817,818, 911,917,918	6
	-667	560Ω	"	"	R822,922	2
	-675	1kΩ	"	"	R840,940	2
	-677	1.5kΩ	"	"	R804,904	2
	-683	2.7kΩ	"	"	R836,936	2
	-691	5.6kΩ	"	"	R841,842,941, 942	4
	-693	6.8kΩ	"	"	R816,916	2
	-697	10kΩ	"	"	R806,809,906,909	4

Ref. No.	Part No.	Description	Q'ty
	1-244-699	12kΩ ±5% RD1/4SR R815,820,915, 920	4
	-701	15kΩ " " R812,912	2
	-703	18kΩ " " R810,910	2
	-721	100kΩ " " R823,923	2
	-731	270kΩ " " R801,802,901, 902	4
	-756	3MΩ " " R803,903	2

iv) General Section

Ref. No.	Part No.	Description	Q'ty
		Transistor 2SD88 Q2,809,810, 909,910	5
		Diode SV-31 D802,902	2
	1-221-634	Resistor, adjustable 1kΩ R251	1
	1-222-212	" , variable 250kΩ (4 gang)	1
	1-231-057	Encapsulated Component 0.033μF+120Ω	1
	1-101-534	" " 0.1μF + 120Ω	1
	1-417-014	Balun	1
#1..	1-441-599	Transformer, power	1
	1-507-163	Jack Plate, 4P	1
	-176	" " , 1P	1
	-260	Jack, stereo headphone	3
	-268	Jack Plate, 8P	1
	1-509-015	AC Outlet	3
	-029	Connector, REC./P.B. (DIN)	1
	1-513-338	Switch, rotary S3,5,8,9,13 - 15	7
	1-514-369	" , " S11	1
	-522	" , " S10	1
#1...	-682	" , " S1	1
	-524	" , slide S12	1
	-525	" , rotary S7	1
	-526	" , " S4	1
#1...	-081	" , " S2	1
	-528	" , " S6	1
	1-517-021	Holder, pilot lamp	1
	-040	" , " "	1
	1-518-011	Lamp, pilot PL2	1
	-062	" , " PL4	1
	-070	" , " (cylinder) PL1,3	2
	1-520-085	Meter, tuning	1
	-086	Meter, tuner input	1
	1-526-165	Voltage Chageover Block	1
#1..	1-536-180	Terminal Strip, 1L2	1
#1...	-182	" " , 2L2	1

Revised

#1....1st Revision
Nov. 1970

Ref. No.	Part No.	Description	Q'ty
	1-526-502	Socket, power transistor	5
	1-533-051	Holder, cylinder lamp	2
	1-534-538	Cord, power	1
	1-536-146	Terminal Strip 1L1	1
	-179	" " 1L1	2
	1-538-771	Printed Circuit Board, balun	1
	-732	" " " , thermistor	2
	1-800-053	Thermistor (positive) CS1,2	2
	7-633-120-42	String, dial 0.5ϕ	1550mm
		Capacitor, mylar	
	1-105-683-12	0.068μF ±10% 50V C533	1
		Capacitor, electrolytic	
	1-121-094	1000μF 35V C18	1
	-330	1000μF 60V C8,15	2
#1...	-734	2000μF 100V C5,19,815,915	4
		Resistor, composition	
	1-201-992	220Ω ±5% RC1/8 R644,744	2
	-398	270Ω " " R645,745	2
	-618	470Ω " " R646,746	2
	-630	820Ω " " R647,747	2
	1-202-005	2.2kΩ " RC1/8L R653,753	2
	-013	3.3kΩ " " R648,652,748,752	4
	-017	3.9kΩ " " R654,663,754,763	4
	-022	4.7kΩ " " R655,656,661, 662,755,756, 761,762	8
	-027	5.6kΩ " " R657,660,757,760	4
	-031	6.8kΩ " " R651,658,659,751, 758,759	6
	-059	18kΩ " " R650,750	2
	-064	22kΩ " " R649,749	2

Revised

#1....1st Revision
Nov. 1970

Ref. No.	Part No.	Description	Q'ty
		Resistor, carbon	
	1-244-649	100Ω ±5% RD1/4SR R19	1
	-697	10kΩ " " R579,603,703	3
	-713	47kΩ " " R601,602,701,702	4
	-719	82kΩ " " R605,705	2
	-737	470kΩ " " R604,704	2
		* **Additional Parts for UL Model**	
	2-057-948	Label, specification (UL)	1
	2-030-610	Sheet, input indicating	1
	3-422-204	Label, caution	1
	3-811-819	Label, FCC	1
		Manual, instruction (UL)	1
		Card, warranty	1
	1-202-645	Resistor, carbon 1MΩ ±10% RC1/2 R20	1
		* **Additional Parts for CSA Model**	
	2-057-964	Label, specification (CSA)	1
	2-030-610	Sheet, input indicating	1
		Manual, instruction (CSA)	1
	3-701-041	Label, CSA	1
	1-201-645	Resistor, composition 1MΩ ±5% RC1/2 R20	1
	3-793-105	Warranty Station List	1
	-107	Card, warranty	1

STEREO RECEIVER

STR-6120

SUPPLEMENT

NO. 1
Dec. '70

Subject: Minor change of Model STR-6120

1. INTRODUCTION

SONY made changes on the STR-6120 to improve its electrical performance.
The change, introduced here, are modifications of the front end, MPX decorder, equalizer and power amplifier circuits.

2. DESCRIPTION OF THE MODIFICATIONS

(TUNER SECTION)

(a) New Front End and RC component have been employed

To obtain a stable receiving operation, a new front end which incorporates AFC circuit, have been employed with RC filter components as follows:

Note: The schematic and mounting diagrams of new front end and RC filter are given on pages 8 to 13. Note that there are two kinds of design in new front end but they have the same part number and are interchangeable.

New Front End

FF-010BW . . . . (part Number, 8-982-592-10)

SONY®
SERVICE MANUAL

New Parts Added

Reference	*Value*	*Part Number*
R330	820 k ohm	1-244-721
R331	100 k ohm	1-244-743
C326	0.15 μF (mylar)	1-105-687-12
C327	0.01 μF (mylar)	1-105-673-12
Terminal strip		1-536-180-11

Applicable Serial Numbers

For USA Model	*For CANADA Model*	*For General Export Model*
82,301 and later	70,101 and later	51,281 and later

Interchangeability

New front end associated with RC filter components and old front end are mutually interchangeable.

(b) De-emphasis Changeover Circuit Added

The de-emphasis changeover circuit has been employed to change the de-emphasis time constant easily. The specified de-emphasis time constant is 75 micro-seconds in USA and CANADA, 50 micro-seconds in Europe. The schematic diagram is given on Page 15.

Parts Added

MPX decoder section

Description	*Value*	*Part Number*
C536, C537	0.022 μF (mylar) and 0.0033 μF (mylar)	1-105-677-12 1-105-667-12
S16 (slide switch)		1-514-524
Terminal strip		1-536-182

Parts Changed

MPX decoder section

Description (former value)	*New Value and Part Number*
C514, C515 0.068 μF	0.047 μF, mylar (1-105-681-12)
C516, C517 0.015 μF	0.0033 μF, mylar (1-105-667-12) or 0.0047 μF, mylar (1-105-669-12)

Applicable Serial Numbers

For USA Model	*For CANADA Model*	*For General Export Model*
82,521 and later	70,101 and later	51,379 and later

(c) Diode Limiter Added

To eliminate harmonic distortion at high level input signal, additional limiter employed in the fm i-f amplifier section.

Note: The schematic diagram is given on pages 12 and 13.

New Parts Added

Reference	*Value*	*Part Number*
D212, D213	1S1555	
C233	0.01 μF, ceramic	1-101-072
C234	20 pF, ceramic	1-101-864
R252	200 ohm	1-244-656
Terminal strip		1-536-179

(AUDIO SECTION)

(a) To increase output power, power transformer and output coupling capacitor changed and filter capacitor for the ripple filter added as follows:

Parts Changed

Description (former value)	*New Value and Part Number*
Power transformer (1-441-455)	Power transformer (1-441-599)
C815,C915, 1000 μF, 100V electrolytic	2000 μF, 100V electrolytic (1-121-734)

Parts Added

Reference	*Value*	*Part Number*
C19	2000 μF, 35 V electrolytic	1-121-734

Applicable Serial Numbers

For USA Model	*For CANADA Model*	*For General Export Model*
82,301 and later	70,101 and later	51,351 and later

(b) In the equalizer amplifier section, the circuit for amplifying the signal from TAPE HEAD input was deleted and another AUX amplifying facility have been employed instead.
The new mounting diagram and equalizer amplifier schematic diagrams are given on pages 6, 7 and 14.

Parts Changed

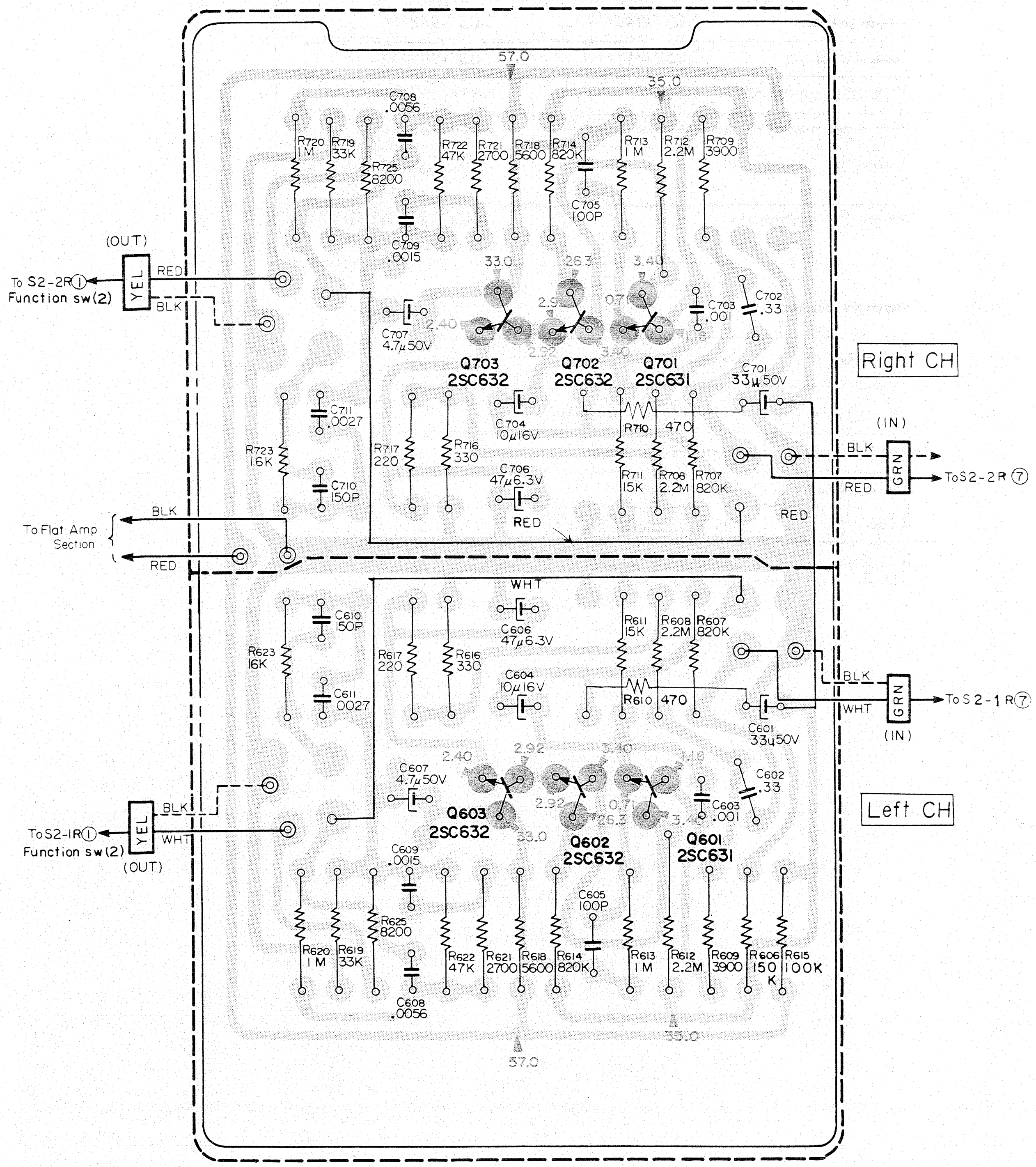
	Former Part Number	*New Part Number*
Front panel	2-057-941	2-057-988
Rear panel	2-057-943	2-057-989
Function switch (S1)	1-514-523-12	1-514-682-11
Function switch (S2)	1-514-527-12	1-514-081-11
R606, 27 k ohm		150 k ohm (L-CH) (1-244-725)
R615, 18 k ohm		100 k ohm (L-CH) (1-244-721)

Parts Removed

Reference	*Value*
C610, C710	150 pF, silvered mica
C611, C711	0.0027 μF, mylar
R623, R723	16 k ohm
R706	27 k ohm (R-CH)
R715	18 k ohm (R-CH)

MOUNTING DIAGRAM–Equalizer Amplifier Section

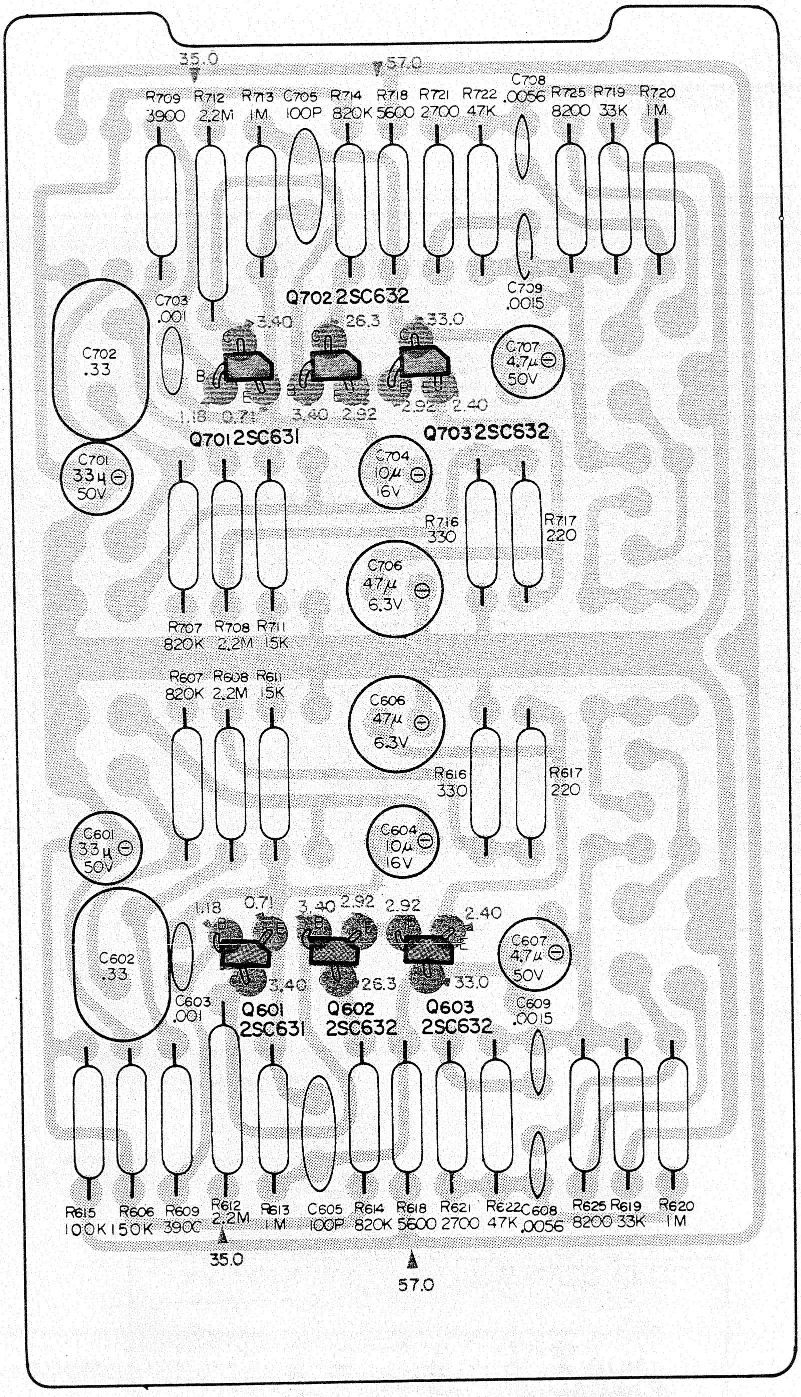
–Conductor Side–


57.0
35.0
C708 .0056
R720 1M
R719 33K
R725 8200
C709 .0015
R722 47K
R721 2700
R718 5600
R714 820K
C705 100P
R713 1M
R712 2.2M
R709 3900
(OUT)
To S2-2R①
Function sw(2)
YEL
RED
BLK
33.0
26.3
3.40
2.40
2.92
0.71
1.18
C707 4.7μ50V
Q703 2SC632
Q702 2SC632
Q701 2SC631
C703 .001
C702 .33
C701 33μ50V
Right CH
(IN)
R723 16K
C711 .0027
C710 150P
R717 220
R716 330
C704 10μ16V
C706 47μ6.3V
R710 470
R711 15K
R708 2.2M
R707 820K
GRN
To S2-2R⑦
To Flat Amp Section
WHT
C610 150P
R623 16K
C611 .0027
R617 220
R616 330
C606 47μ6.3V
C604 10μ16V
R611 15K
R608 2.2M
R607 820K
R610 470
C601 33μ50V
To S2-1R⑦
C607 4.7μ50V
Q603 2SC632
Q602 2SC632
Q601 2SC631
C602 .33
C603 .001
Left CH
To S2-1R①
C609 .0015
C605 100P
R620 1M
R619 33K
R625 8200
C608 .0056
R622 47K
R621 2700
R618 5600
R614 820K
R613 1M
R612 2.2M
R609 3900
R606 150K
R615 100K

※ R610 and R710 are mounted on conductor side.

MOUNTING DIAGRAM–Equalizer Amplifier Section

–Component Side–


35.0
57.0
R709 3900
R712 2.2M
R713 1M
C705 100P
R714 820K
R718 5600
R721 2700
R722 47K
C708 .0056
R725 8200
R719 33K
R720 1M
C703 .001
C702 .33
Q702 2SC632
3.40
26.3
33.0
C707 4.7μ 50V
C709 .0015
1.18
0.71
3.40
2.92
2.92
2.40
Q701 2SC631
Q703 2SC632
C701 33μ 50V
C704 10μ 16V
R716 330
R717 220
C706 47μ 6.3V
R707 820K
R708 2.2M
R711 15K
R607 820K
R608 2.2M
R611 15K
C606 47μ 6.3V
R616 330
R617 220
C601 33μ 50V
C604 10μ 16V
1.18
0.71
3.40
2.92
2.92
2.40
C602 .33
C607 4.7μ 50V
3.40
26.3
33.0
C603 .001
Q601 2SC631
Q602 2SC632
Q603 2SC632
C609 .0015
R615 100K
R606 150K
R609 3900
R612 2.2M
R613 1M
C605 100P
R614 820K
R618 5600
R621 2700
R622 47K
C608 .0056
R625 8200
R619 33K
R620 1M
35.0
57.0

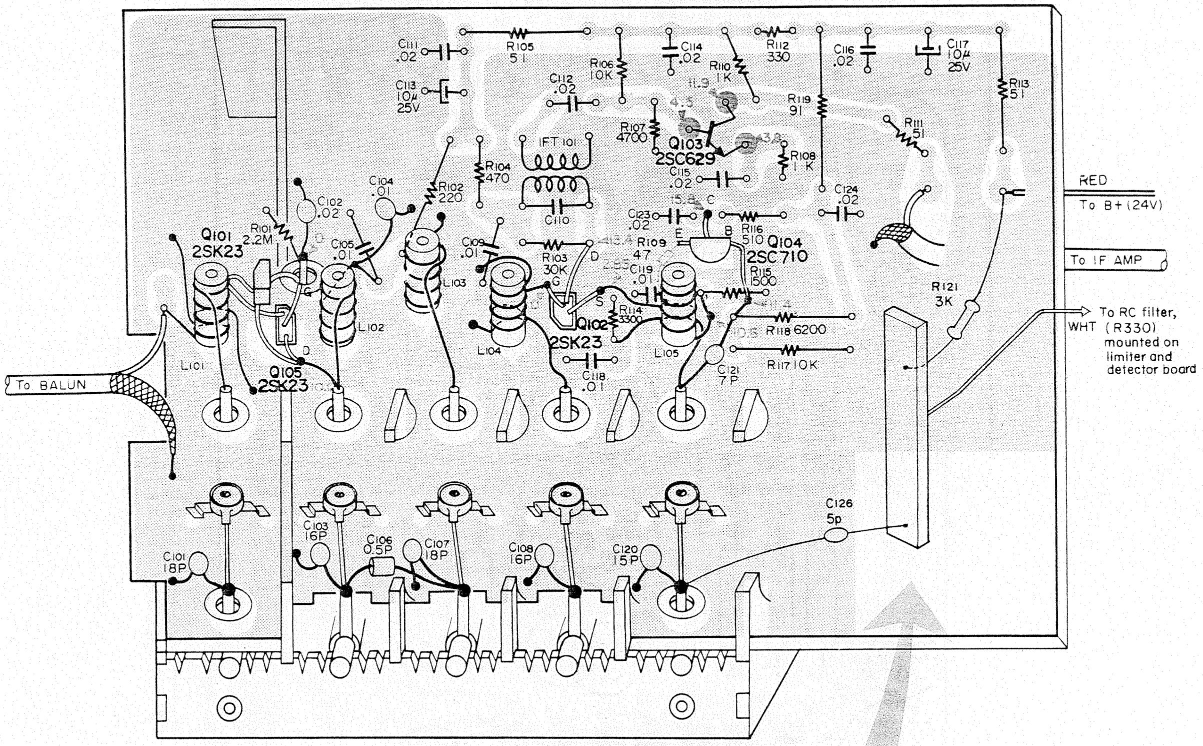
MOUNTING DIAGRAM

New Front End Section

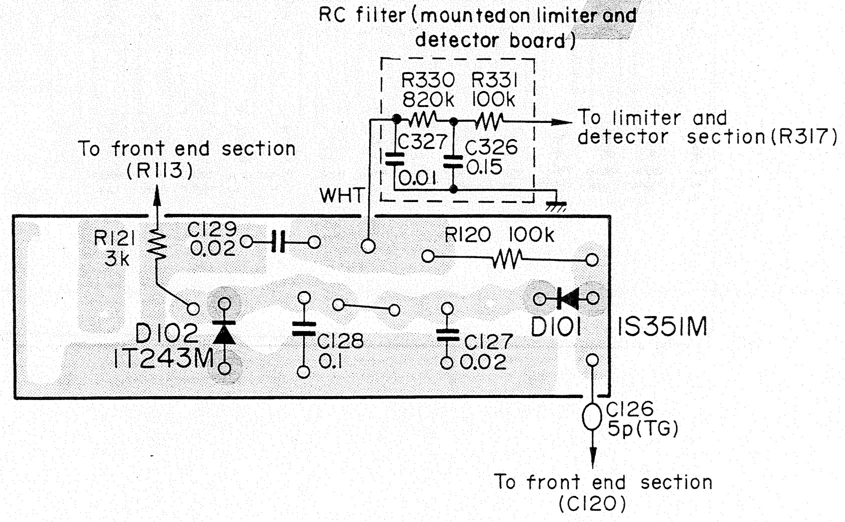
Note that there are two kinds of design in new front end but they have the same part number and are mutually interchangeable as shown on pages 8 to 11.

–Front End Section [1]

–Conductor Side–


C111
.02
R105
51
C113
10µ
25V
R106
10K
C112
.02
C114
.02
R110
1K
R112
330
C116
.02
C117
10µ
25V
R113
51
R119
91
R111
51
R107
4700
Q103
2SC629
R108
1K
IFT 101
R104
470
C115
.02
C124
.02
C104
.01
R102
220
C102
.02
C110
C123
.02
C
E
B
R116
510
Q104
2SC710
R101
2.2M
Q101
2SK23
C105
.01
C109
.01
R103
30K
D
G
R109
47
C119
.01
R115
1500
S
R114
3300
Q102
2SK23
L103
L102
L104
L105
R118 6200
R117 10K
C121
7P
C118
.01
L101
Q105
2SK23
To BALUN
RED
To B+(24V)
To IF AMP
R121
3K
To RC filter,
WHT (R330)
mounted on
limiter and
detector board
C126
5p
C101
18P
C103
16P
C106
0.5P
C107
18P
C108
16P
C120
15P

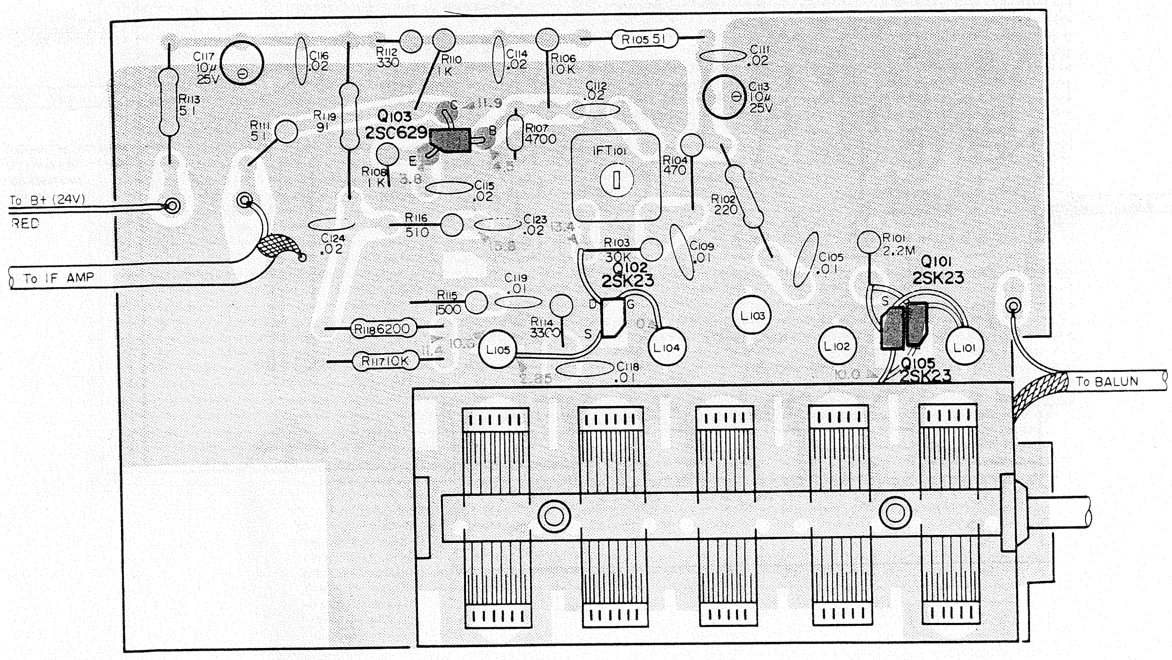
AFC Circuit Board


RC filter (mounted on limiter and
detector board)
R330
820k
R331
100k
C327
0.01
C326
0.15
To limiter and
detector section (R317)
To front end section
(R113)
WHT
R121
3k
C129
0.02
R120 100k
D102
1T243M
C128
0.1
C127
0.02
D101
1S351M
C126
5p(TG)
To front end section
(C120)

MOUNTING DIAGRAM

–Front End Section [1]

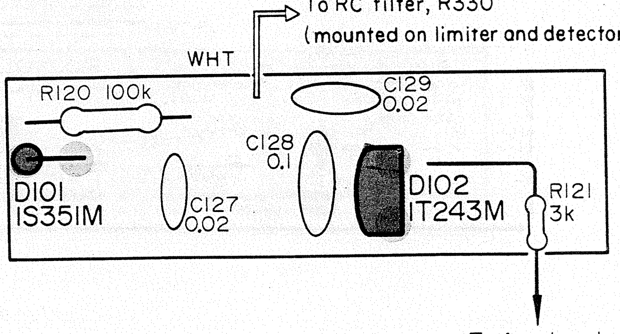
–Component Side–


C117
10μ
25V
C116
.02
R112
330
R110
1K
C114
.02
R106
10K
R105 51
C111
.02
C113
10μ
25V
C112
.02
R113
5.1
R111
5.1
R119
91
Q103
2SC629
C
11.9
B
E
R107
4700
4.5
R108
1K
3.8
C115
.02
IFT101
R104
470
R102
220
To B+ (24V)
RED
To IF AMP
C124
.02
R116
510
C123
.02
13.4
R103
30K
Q102
2SK23
C109
.01
C105
.01
R101
2.2M
Q101
2SK23
R115
1500
C119
.01
D
G
S
R118 6200
R117 10K
R114
3300
L105
L104
L103
L102
L101
C118
.01
2.85
10.0
Q105
2SK23
To BALUN

AFC Circuit Board

※ AFC circuit board is mounted on conductor side of front end FF-010BW as shown on page 8.

To RC filter, R330
(mounted on limiter and detector board)

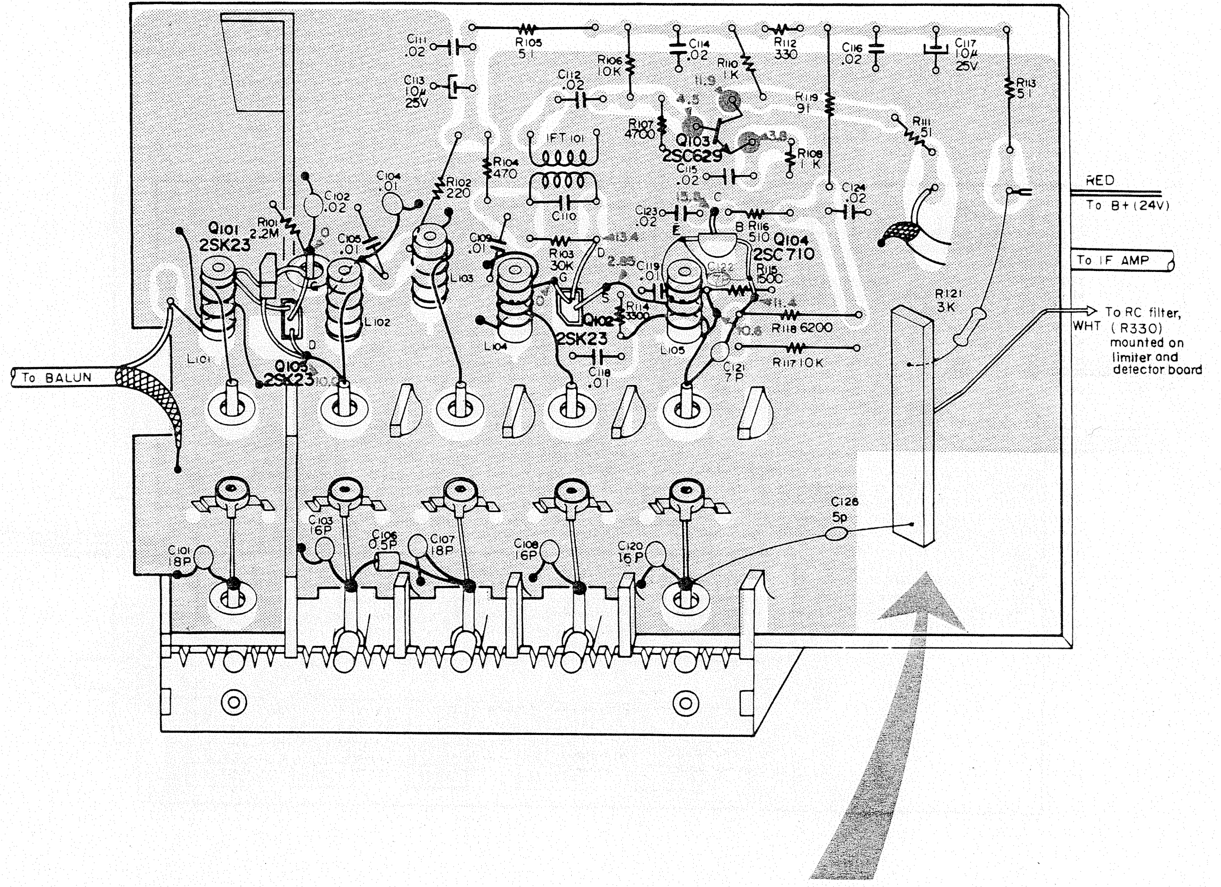

WHT
R120 100k
C129
0.02
C128
0.1
D101
IS351M
C127
0.02
D102
IT243M
R121
3k

To front end section,
(R113)

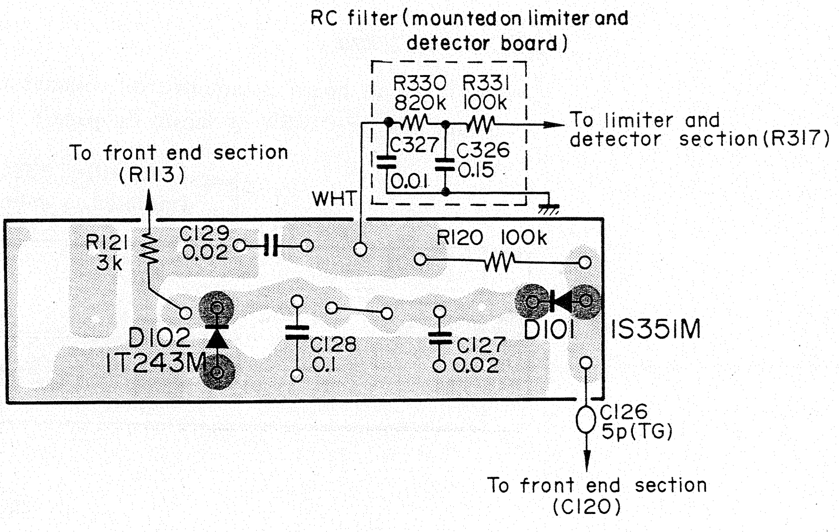
MOUNTING DIAGRAM

–Front End Section [2]

–Conductor Side–


C111 .02
C113 10μ 25V
R105 5.1
C112 .02
R106 10K
C114 .02
R110 1K
R112 330
C116 .02
C117 10μ 25V
R113 5.1
R119 91
R107 4700
Q103 2SC629
R108 1K
R111 51
IFT 101
R104 470
C115 .02
C124 .02
RED
To B+(24V)
To IF AMP
C104 .01
R102 220
C102 .02
C110
C123 .02
R116 510
Q104 2SC710
Q101 2SK23
R101 2.2M
C105 .01
C109 .01
R103 30K
C119 .01
R115 150
R121 3K
L103
L102
L104
Q102 2SK23
R114 330
R118 6200
R117 10K
C121 7P
C118 .01
L105
L101
Q105 2SK23
To BALUN
To RC filter, (R330) mounted on limiter and detector board
WHT
C126 5p
C101 18P
C103 16P
C106 0.5P
C107 18P
C108 16P
C120 16P

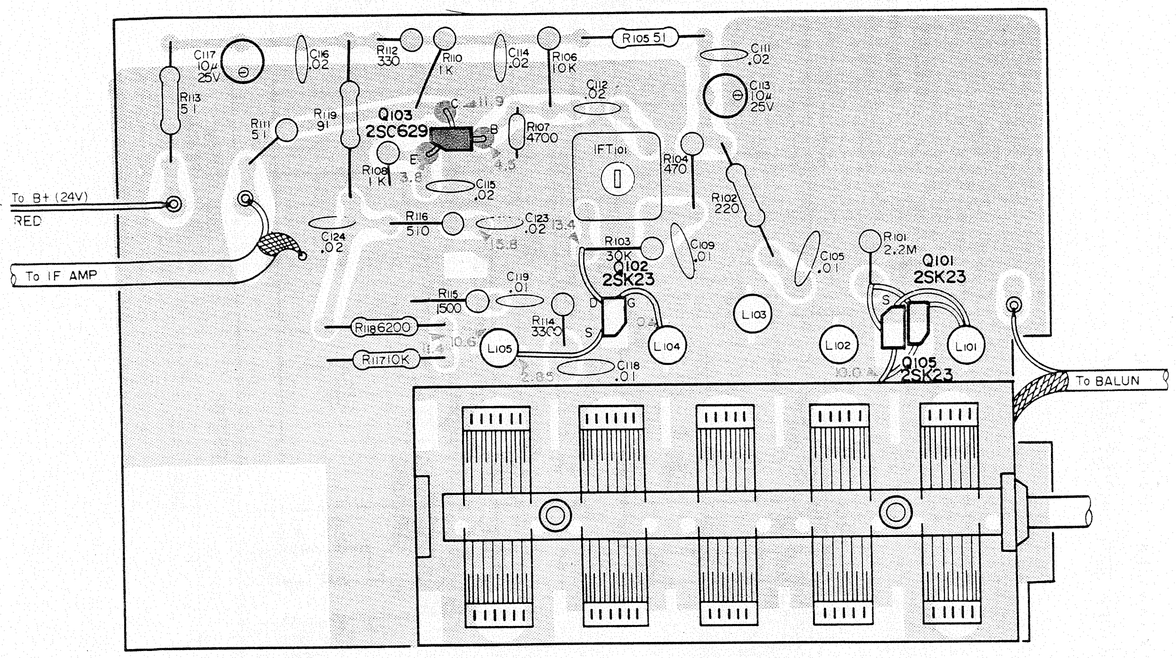
AFC Circuit Board


RC filter (mounted on limiter and detector board)
R330 820k
R331 100k
C327 0.01
C326 0.15
To limiter and detector section (R317)
To front end section (R113)
WHT
R121 3k
C129 0.02
R120 100k
D102 1T243M
C128 0.1
C127 0.02
D101
1S351M
C126 5p(TG)
To front end section (C120)

MOUNTING DIAGRAM

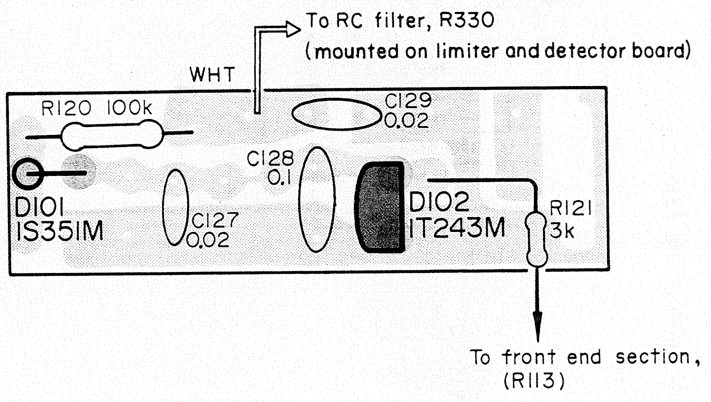
–Front End Section [2]

–Component Side–


C117
10µ
25V
C116
.02
R112
330
R110
1K
C114
.02
R106
10K
R105 51
C111
.02
C112
.02
C113
10µ
25V
R113
51
R111
51
R119
91
Q103
2SC629
C
11.9
B
E
4.5
R107
4700
IFT101
R104
470
R108
1K
3.8
C115
.02
R102
220
To B+ (24V)
RED
C124
.02
R116
510
C123
.02
13.4
15.8
R103
30K
C109
.01
R101
2.2M
Q101
2SK23
To IF AMP
Q102
2SK23
C105
.01
C119
.01
R115
1500
D
G
S
R114
3300
L103
R118 6200
R117 10K
L105
L104
L102
L101
C118
.01
Q105
2SK23
To BALUN

AFC Circuit Board

※ AFC circuit board is mounted on conductor side of front end FF-010BW as shown on page 10.

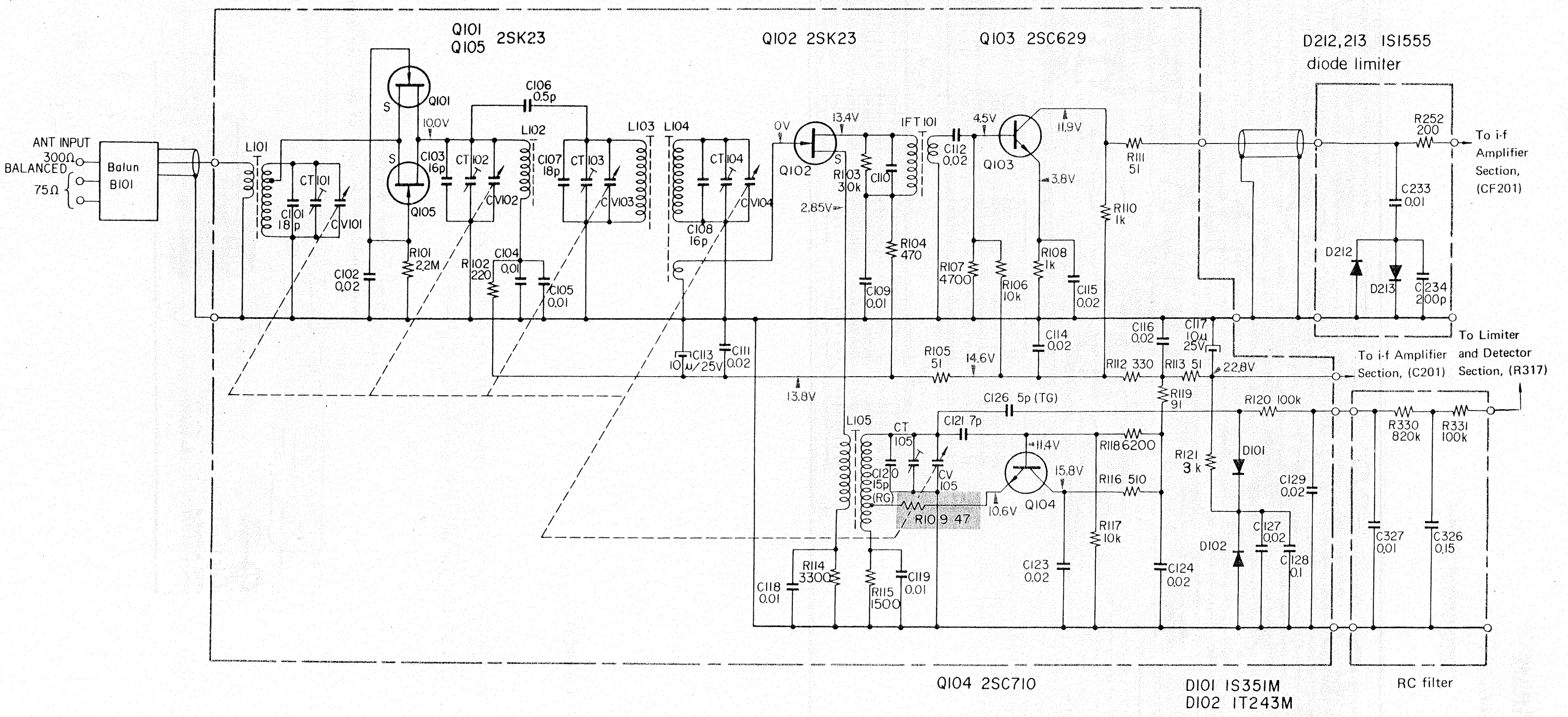

To RC filter, R330
(mounted on limiter and detector board)
WHT
R120 100k
C129
0.02
C128
0.1
D101
IS351M
C127
0.02
D102
IT243M
R121
3k
To front end section,
(R113)

SCHEMATIC DIAGRAM

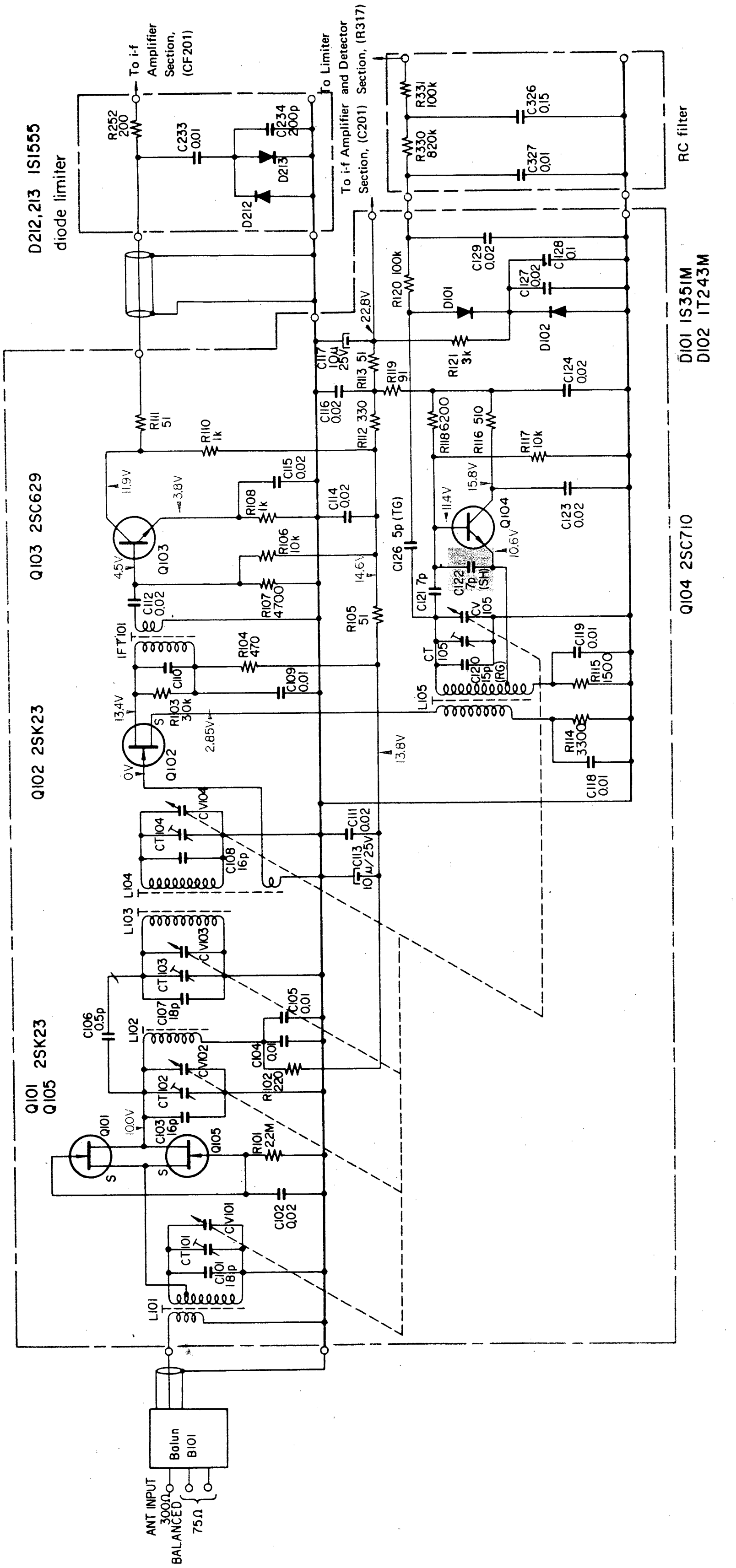
New Front End Section

Note that there are tow kinds of design in new front end but they have the same part number and are mutually interchangeable as shown on pages 12 to 13.

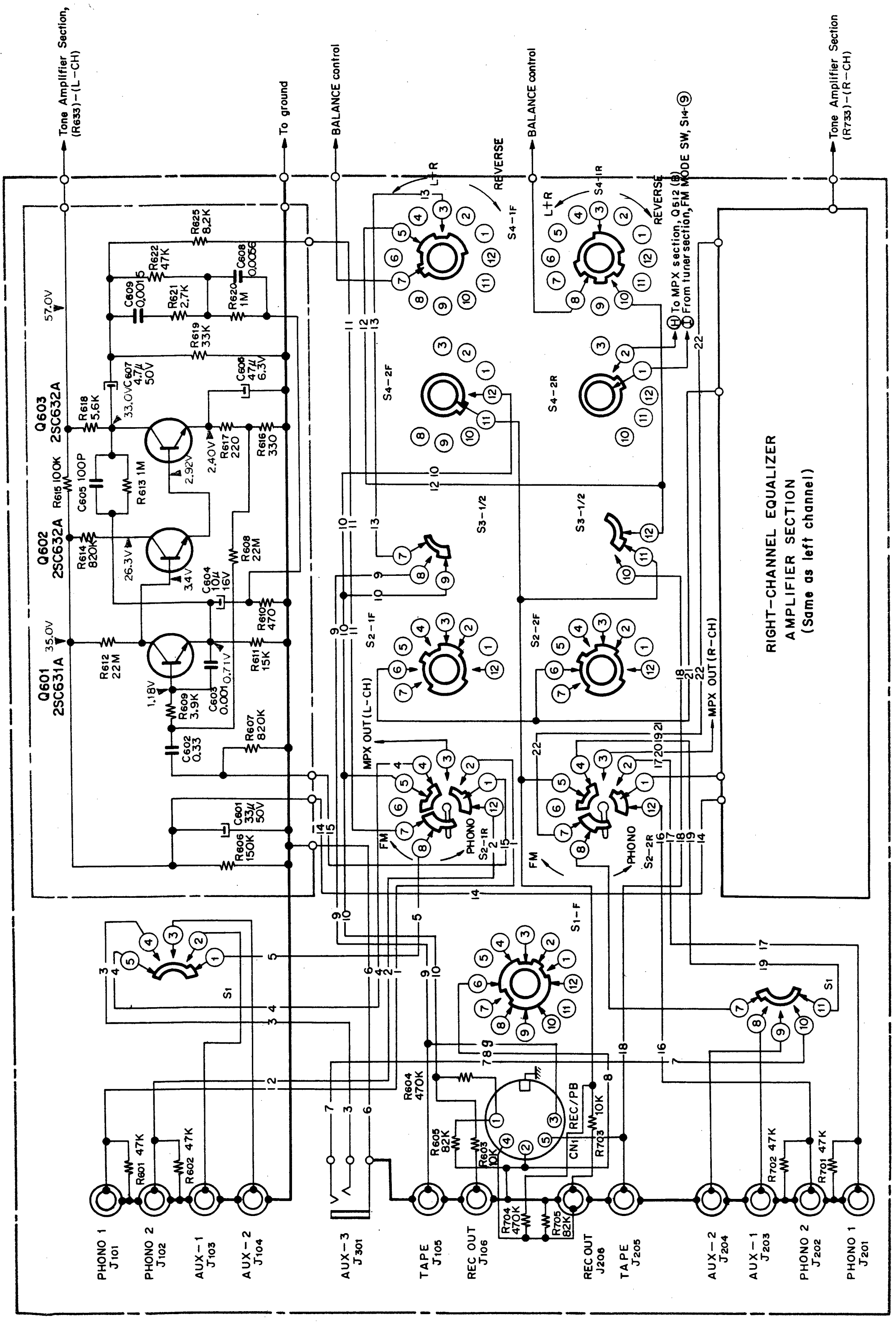
–Front Edn Section [1]–


ANT INPUT
300Ω
BALANCED
75Ω
Balun
B101
L101
CT101
C101 18p
CV101
C102 0.02
Q101
Q105
2SK23
10.0V
S
C103 16p
CT102
CV102
R101 2.2M
R102 220
C104 0.01
C105 0.01
C106 0.5p
L102
C107 18p
CT103
CV103
L103
L104
CT104
CV104
C108 16p
C113 10μ/25V
C111 0.02
Q102 2SK23
0V
13.4V
Q102
R103 30k
C110
2.85V
IFT101
R104 470
C109 0.01
13.8V
C112 0.02
4.5V
Q103 2SC629
Q103
11.9V
3.8V
R107 4700
R106 10k
R108 1k
C115 0.02
C114 0.02
R105 51
14.6V
R111 51
R110 1k
C116 0.02
C117 10μ 25V
R112 330
R113 51
22.8V
R119 91
C126 5p (TG)
C121 7p
L105
CT 105
C120 15p (RG)
CV 105
R109 47
11.4V
15.8V
10.6V
Q104
R118 6200
R116 510
R117 10k
R121 3k
C123 0.02
C124 0.02
R114 3300
C118 0.01
R115 1500
C119 0.01
Q104 2SC710
R120 100k
D101
D102
C127 0.02
C128 0.1
C129 0.02
D101 IS351M
D102 IT243M
D212,213 IS1555
diode limiter
R252 200
C233 0.01
D212
D213
C234 200p
To i-f Amplifier Section, (CF201)
To i-f Amplifier Section, (C201)
To Limiter and Detector Section, (R317)
R330 820k
R331 100k
C327 0.01
C326 0.15
RC filter

SCHEMATIC DIAGRAM—Front End Section [2]


ANT INPUT
300Ω BALANCED
75Ω
Balun B101
L101
CT101
C101 18p
CV101
C102 0.02
Q101
Q105
Q101 Q105 2SK23
S
10.0V
R101 2.2M
C103 16p
CT102
CV102
L102
R102 220
C104 0.01
C105 0.01
C106 0.5p
C107 18p
CT103
CV103
L103
L104
CT104
CV104
C108 16p
C111 0.02
C113 10μ/25V
Q102 2SK23
Q102
0V
13.4V
R103 30k
2.85V
C110
C109 0.01
R104 470
IFT101
C112 0.02
R107 4700
R106 10k
R105 51
14.6V
13.8V
Q103 2SC629
Q103
4.5V
11.9V
3.8V
R108 1k
C114 0.02
C115 0.02
R110 1k
R111 51
R112 330
C116 0.02
R113 51
C117 10μ 25V
R119 91
22.8V
C126 5p (TG)
C121 7p
C122 7p (SH)
CV 105
CT 105
C120 15p (RG)
L105
Q104 2SC710
Q104
11.4V
15.8V
10.6V
R118 6200
R116 510
R117 10k
C123 0.02
C124 0.02
R121 3k
R120 100k
D101
D102
C127 0.002
C128 0.1
C129 0.02
C119 0.01
R115 1500
R114 3300
C118 0.01
D101 1S351M
D102 1T243M
R252 200
C233 0.01
C234 200p
D212
D213
D212,213 1S1555
diode limiter
To i-f Amplifier Section, (CF201)
To Limiter
To i-f Amplifier and Detector Section, (C201) Section, (R317)
R331 100k
R330 820k
C326 0.15
C327 0.01
RC filter

SCHEMATIC DIAGRAM–Equalizer Amplifier Section–

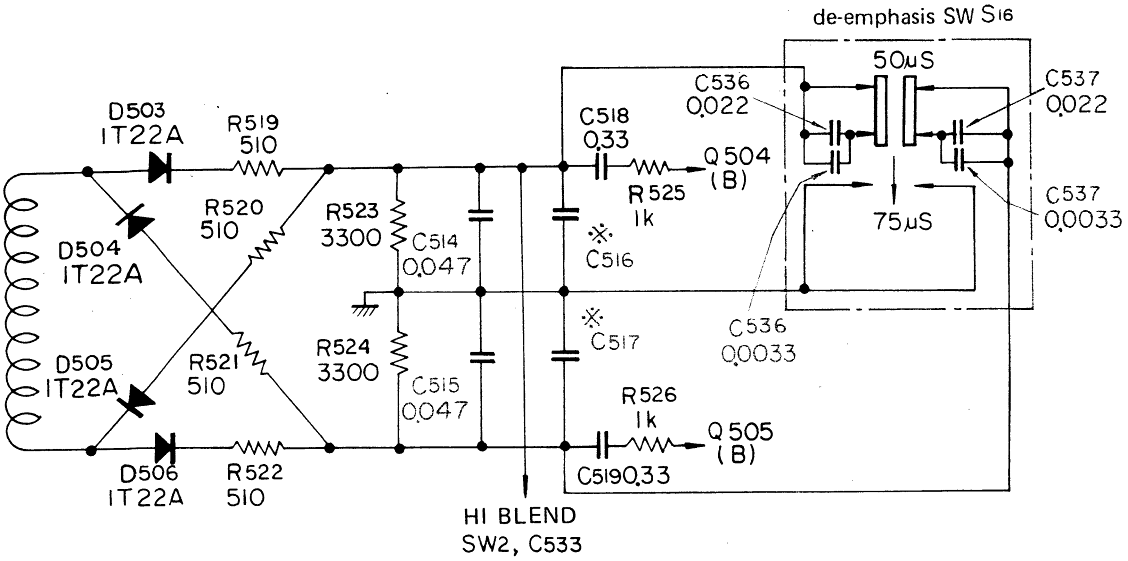

Tone Amplifier Section, (R633)-(L-CH)
To ground
BALANCE control
BALANCE control
Tone Amplifier Section (R733)-(R-CH)
To MPX section, Q512 (B)
From tuner section, FM MODE SW, S14-⑨
Q601 2SC631A
Q602 2SC632A
Q603 2SC632A
57.0V
35.0V
33.0V
26.3V
3.4V
2.92V
2.40V
1.18V
0.71V
R601 47K
R602 47K
R603 10K
R604 470K
R605 82K
R606 150K
R607 820K
R608 22M
R609 3.9K
R610 470
R611 15K
R612 22M
R613 1M
R614 820K
R615 100K
R616 330
R617 220
R618 5.6K
R619 33K
R620 1M
R621 2.7K
R622 47K
R625 8.2K
C601 33µ 50V
C602 0.33
C603 0.001
C604 10µ 16V
C605 100P
C606 47µ 6.3V
C607 4.7µ 50V
C608 0.0056
C609 0.0015
R701 47K
R702 47K
R703 10K
R704 470K
R705 82K
S1
S1-F
S2-1F
S2-1R
S2-2F
S2-2R
S3-1/2
S4-1F
S4-1R
S4-2F
S4-2R
L+R
REVERSE
FM
PHONO
MPX OUT (L-CH)
MPX OUT (R-CH)
CN1 REC/PB
PHONO 1 J101
PHONO 2 J102
AUX-1 J103
AUX-2 J104
AUX-3 J301
TAPE J105
REC OUT J106
REC OUT J206
TAPE J205
AUX-2 J204
AUX-1 J203
PHONO 2 J202
PHONO 1 J201
RIGHT-CHANNEL EQUALIZER AMPLIFIER SECTION (Same as left channel)

Symbol	Description	Position
S1	FUNCTION (1) SW (PHONO2-AUX1-AUX2-AUX3)	PHONO-2
S2	FUNCTION (2)SW (FM-FUNCTION1-PHONO1)	FUNCTION (1)

Symbol	Description	Position
S3	MONITOR SW (SOURCE-TAPE)	SOURCE
S4	MODE SW (CHECKL-CHECKR-REVERSE-STEREO-LTR-LEFT-RIGHT)	STEREO

SCHEMATIC DIAGRAM–MPX Decoder Section

–Additional AFC Switch and related circuit–


de-emphasis SW S16
50μS
75μS
C536
0.022
C537
0.022
C537
0.0033
C536
0.0033
D503
1T22A
R519
510
D504
1T22A
R520
510
D505
1T22A
R521
510
D506
1T22A
R522
510
R523
3300
C514
0.047
R524
3300
C515
0.047
C516
C517
C518
0.33
R525
1k
Q504
(B)
R526
1k
Q505
(B)
C519 0.33
HI BLEND
SW2, C533

MEMO